



جامعة صنعاء
كلية الطب والعلوم الصحية
دائرة العلوم السريرية الطبية
دفعة بصمه طبيب 31
طب بشري

OPHTHALMOLOGY



Anatomy and Examination

Sclera

Orbit

Eyelid

Visual pathway

Lectures

Lecture No. **1-6**

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اللجنة العلمية Group C

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~ ANATOMY&EXAMINATION OF THE EYE

BY :

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4th.November , 2017

Learning Objective:

- To learn the development of the eye
- To learn the anatomy of the eye, the orbit , the blood vessels , the nerve supply of the eye

DEVELOPMENT OF THE EYE

- The eye is partly mesoderm & partly ectoderm in origin.
- Mesoderm will give rise to the following structures:
 1. Cornea except the epithelium
 2. Sclera.
 3. Choroid .
 4. Iris and ciliary body except the pigmented epithelium.
 5. Extra- ocular muscles .
- Surface ectoderm will give rise to the following structures
 1. Skin of lids .
 2. Lacrimal system.
 3. Conjunctiva.
 4. Epithelium of cornea.
 5. Crystalline lens
- Neural ectoderm will give rise to the following structures:
 1. Retina.
 2. Optic nerve .
 3. Pigmented epithelium of iris and ciliary body.
 4. Sphincter and dilator pupillae muscles.

Dimensions Of An Adult Eyeball

- | | |
|------------------------------------|----------|
| 1. Anterioposterior diameter | 24 mm. |
| 2. Lateral (horizontal) diameter | 23.5 mm. |
| 3. Vertical diameter | 23 mm. |
| 4. Circumference | 75 mm. |
| 5. Volume | 6.5 ml. |
| 6. Weight | 7 g. |

Anatomy Of The Eye And Orbit Is Divided Into Three Parts:

1. The Orbital Cavity.
2. The Adnexia.
3. The Eye Ball.

THE ORBITAL CAVITY

- A pair of large bony socket
- Each cavity is a pear –shaped composed of seven bones.
- The orbital walls are four :
Roof ,floor, medial and lateral walls.

Orbit:

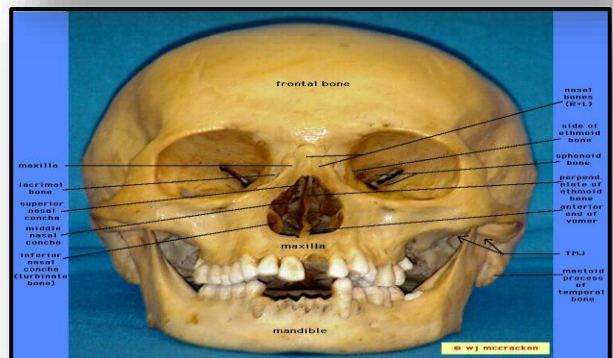
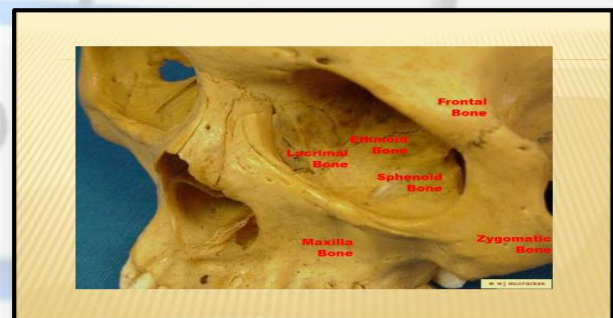
- Cavity or socket of the skull which houses the eye.
- Protects and stabilizes the eye.
- Serves as attachment site for extrinsic muscles.
 - Orbital Margins – bases which open in the face (4 borders)
 - Supraorbital margin – frontal bone
 - Intraorbital margin – zygomatic and maxilla bones
 - Lateral margin – zygomatic and frontal bones



- **Yellow** – Frontal Bone
- **Blue** – Zygomatic Bone
- **Purple** – Maxilla Bone

Orbital Anatomy:

1. Anterior aspect or roof
 - Frontal Bone
2. Posterior aspect
 - Sphenoid Bone
3. Medial aspect
 - Lacrimal, ethmoid, maxillary, and sphenoid bones
4. Lateral aspect
 - Zygomatic and sphenoid bones
 - Orbit is thickest



THE MAIN ORBITAL OPENINGS

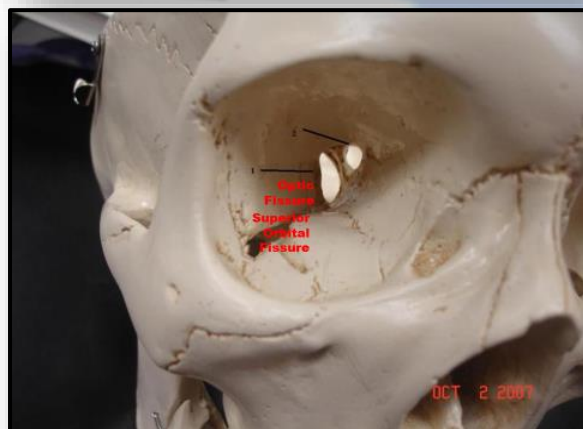
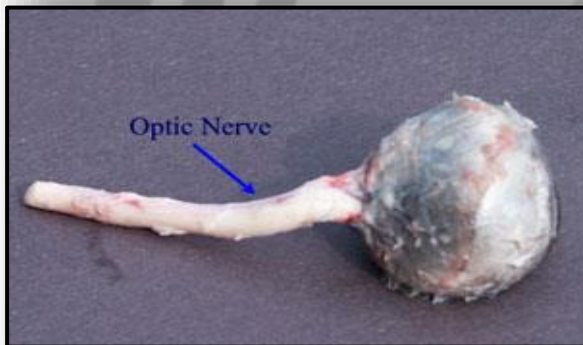
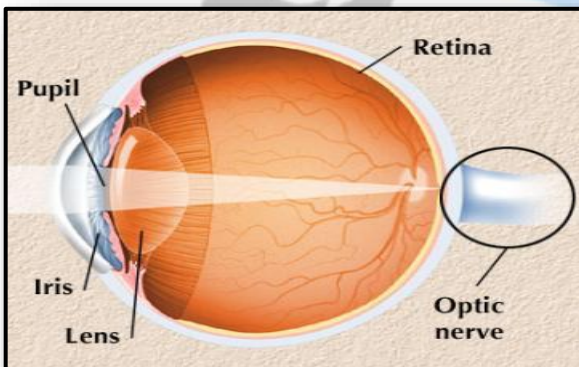
- 1- The Optic Canal.
- 2- The Superior Orbital Fissure.
- 3- The Inferior Orbital Fissure

1. Superior Orbital Fissure

- Opening between lesser and greater wings of sphenoid bone
- Allows cranial nerves, arteries, and veins to communicate with eye

2. Optic Canal

- Foramen which the optic nerve passes to reach the brain
- Optic Nerve
 - Cranial nerve II
 - Transmits visual information from the retina to the brain



ANATOMY OF THE ORBIT

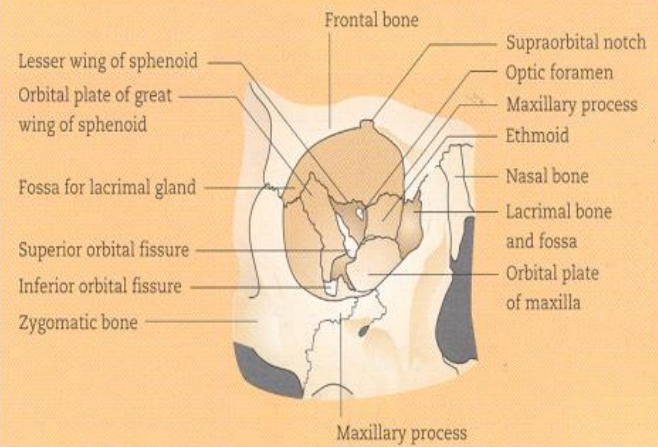
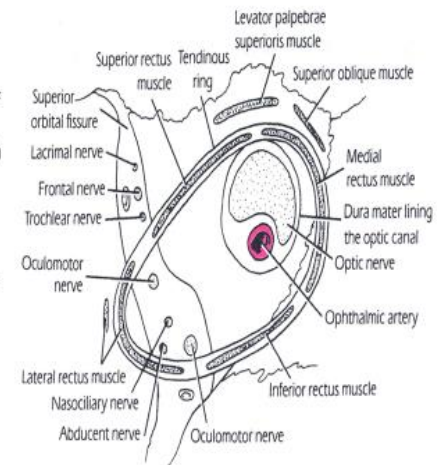


Figure 8-16

Diagram of the apical region of the right orbit, showing the common tendinous ring, which gives origin to the four rectus muscles. This also shows the origins of the levator palpebrae superioris and the superior oblique muscles. Note the positions of the nerves and blood vessels entering the orbital cavity.

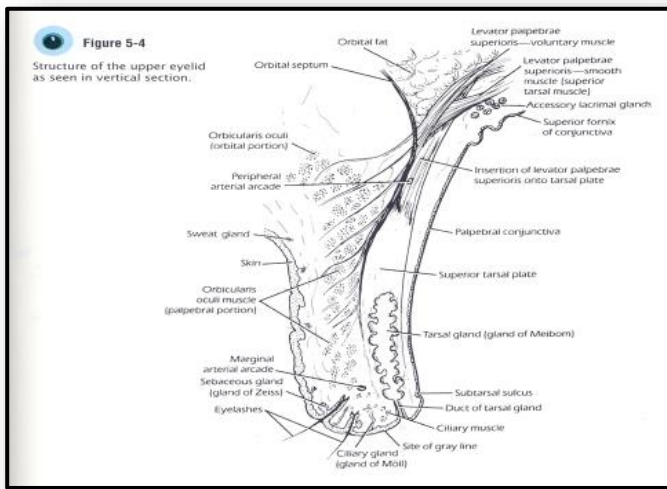


THE ADNEXIA

- 1- The Eyelids.
- 2- The Lacrimal Apparatus.
- 3- The Conjunctiva.
- 4- The E.O.M.

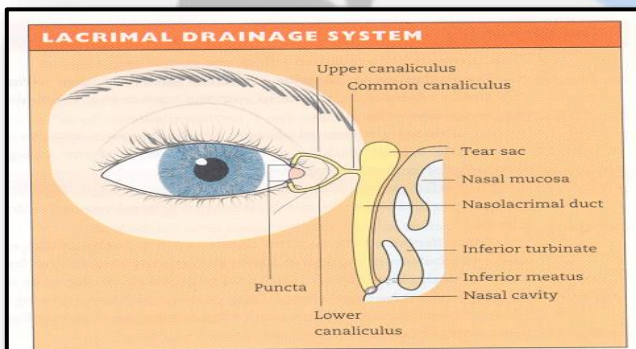
THE EYELIDS COMPRISE OF:

1. Skin
2. Subcutaneous tissue.
3. Straited muscle fibre of the orbicularis oculi.
4. Orbital septum and tarsal plate.
5. Smooth muscle
6. Conjunctiva



THE LACRIMAL APPARATUS

- Consists of 2 parts :
 - Seceratory part composed of :
Lacrimal gland, and accessory lacrimal glands
 - Excretory part composed of:
Puncti, canaliculi, lacrimal sac and nasolacrimal duct.

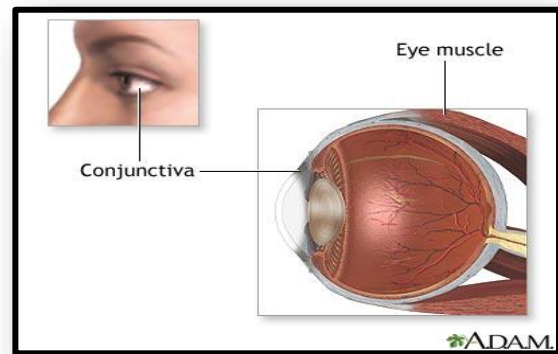


The Conjunctiva

- Thin mucous membrane that lines the eyelids and is reflected at the sup. And inf. Fornices into the ant. Surface of the eyeball.
- The conjunctiva is divided into:
 - The palpebral conj.
 - The conj. Fornices
 - The bulbar conj.

Conjunctiva:

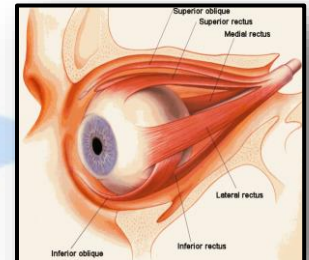
- Thin mucous membrane that covers the outer surface of the eye (sclera).
- Lines inside of the eyelids.
- Anteriorly - continuous with the cornea.
- Nourished by tiny blood vessels (nearly invisible to the naked eye).
- Secretes oils and mucous that moisten and lubricate the eye.



The Extra- Ocular Muscles

Muscular Anatomy:

- Inferior rectus
- Superior rectus
- Medial rectus
- Lateral rectus
- Inferior oblique
- Superior oblique



Eye Movement Terminology:

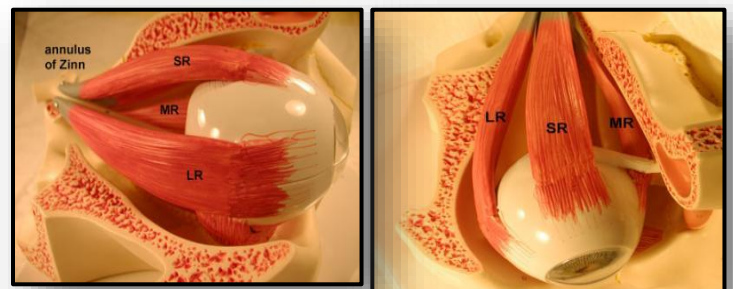
- Duction movement of one eye by itself.
- Version – movement of the 2 eyes in the same direction.
- Adduction – eye looks toward the nose.
- Abduction – eye looks toward the ear.
- Dextroversion – both eyes look to the right.
- Levoersion – both eyes look to the left.
- Suprersion – both eyes upgaze.
- Infrersion – downgaze.

Medial Rectus:

- Strongest of the extra-ocular muscles
- Most mass of eoms
- Most anterior insertion (extra leverage)
- Action – adduction (eyes move towards the nose)

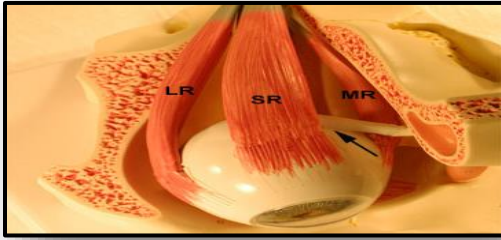
Lateral Rectus:

- Action - abduction

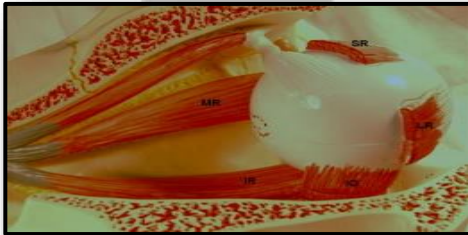


Superior Rectus:

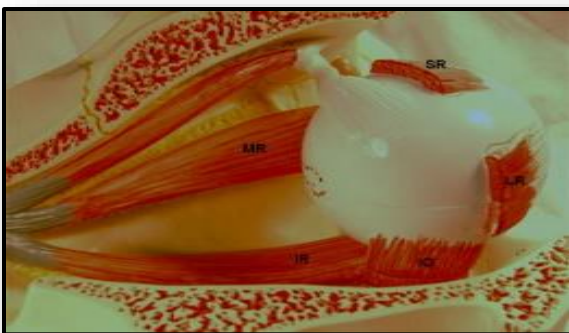
- Action—elevation, upward rotation
 - Rotation – angles nasally toward site of origin.
- Tendon of the superior oblique muscle passes underneath the SR.

**Inferior Rectus:**

- Action – depression, downward rotation, adduction.

**Superior Oblique:**

- Keeps the eyeballs level as the head tilts.
- Longest of the EOMs.
- Passes through a “pulley” called the trochlea
 - Redirects the action
- Action:
 - Abduction of globe
 - Depression of globe
 - Rotation of globe



Muscle	Action	Origin	Insertion	Innervation
Inferior Rectus	Depression, Downward Rotation	From a tendinous ring on posterior aspect of orbit	Middle of the inferior aspect of anterior globe	Oculomotor
Superior Rectus	Elevation, Upward Rotation	From a tendinous ring on posterior aspect of orbit	Middle of the superior aspect of anterior globe	Oculomotor
Medial Rectus	Medial Rotation (Adduction)	From a tendinous ring on posterior aspect of orbit	Middle of the superior aspect of anterior globe	Oculomotor
Lateral Rectus	Lateral Rotation (Abduction)	From a tendinous ring on posterior aspect of orbit	Middle of the superior aspect of anterior globe	Abducens
Inferior Oblique	Adduction, Elevation of globe, Rotation of globe when abducted	From the periosteum of the maxilla	Inferolateral quadrant of the globe	Oculomotor
Superior Oblique	Abduction, Depression of globe, Rotation of globe when adducted	Greater wing of the sphenoid	Superolateral quadrant of the globe	Trochlear

The Eyeball**General characters:**

- Site: bony cavity
- Shape: spherical
- Diameter: 24 mm weight: 7 grams
- Equator: mid way between ant. And post. Poles , 12 mm post to the limbus.
- Refractive media:
 - Cornea 1.37, aqueous 1.33
 - Lens: 1.42, vit. 1.33.
 - Refractive power: Cornea: 42 d. Lens: 18 d

The Eye Comprises Of :

- 1- A tough outer coat : cornea, sclera
- 2- A rich vascular coat: iris, c.b. And choroid.
- 3- A nervous coat :the retina.

Chambers of the eye ball:

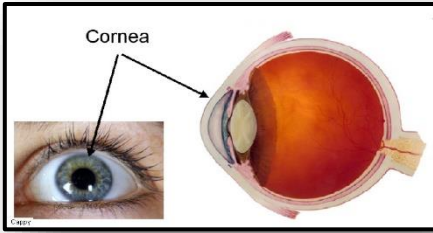
- Ant. Chamber .
- Post. Chamber.

Refractive media of the eye:

- Lens.
- Vitreous.

Cornea:

- Transparent, dome-shaped window covering the front of the eye (normally clear with a shiny surface).
- Powerful refracting surface (provides 2/3 of the eye's focusing power).
- Extremely sensitive
 - More nerve endings in the cornea than anywhere else in the body

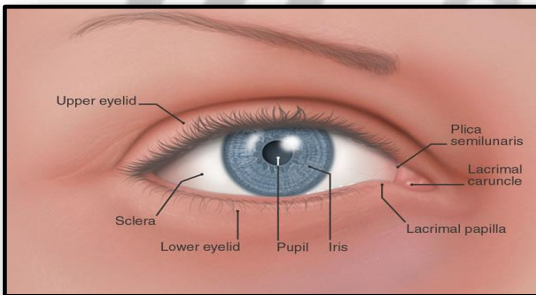


Sclera:

- White of the eye
- Tough, opaque tissue that serves as the eye's protective outer
- Optic nerve is attached to the sclera at the very back of the eye

Pupil:

- Opening in center of iris
- Size of the pupil determines the amount of light that enters the eye
- Pupil size is controlled by the dilator and sphincter muscles of the iris
- Neurological function – pupils reaction to light



Iris:

- Colored part of the eye
- Controls light levels inside the eye
- Divides the anterior chamber from posterior chamber
- Color comes from microscopic pigment cells (melanin)
- The color, texture, and patterns of each person's iris are as unique as a fingerprint

Muscles acting on iris:

- Sphincter muscle:
 - In bright light, the sphincter contracts, causing the pupil to constrict
- Dilator muscle:
 - Dilates the eye in dim lighting

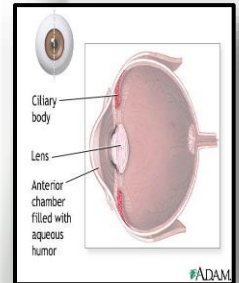


Ciliary body:

- Lies behind the iris
- Attached to the ciliary body are tiny fiber ligaments (zonules) – suspend the lens
- Produces aqueous humor (clear fluid that fills the front of the eye)
- Controls accommodation to light by changing the shape of the lens
 - Ciliary body contracts - zonules relax and lens thicken, ↑ the eye's ability to focus up close
 - Ciliary body relaxes - zonules contract and lens becomes thinner, adjusting the eye's focus for distance vision

Lens:

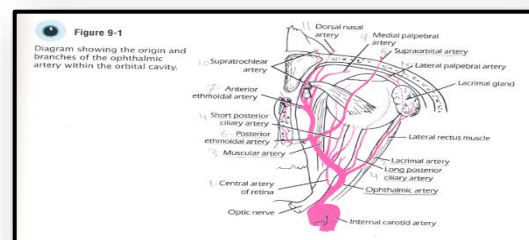
- Located just behind the iris
- Focuses light onto the retina



Retina:

- Multi-layered sensory tissue that lines the back of the eye.
- Contain millions of photoreceptors that capture light rays and converts them into electrical impulses
 - Impulses: optic nerve to brain (images)
 - Cones (6 million)
 - Bright light (help us differentiate color).
 - Rods (125 million)
 - Peripheral and night vision.

The Ocular Blood Supply



The Orbital Nerves

- 1- motor nerves : 3rd , 4th and 6th
- 2- sensory:
 - Ophthalmic and maxillary division of the trigeminal nerve.
 - Optic nerve .
- 3- Autonomic:
 - Sympathetic .
 - Parasympathetic



~History And Examination

Learning Objective To Be Able To :

1. Take and understand an ophthalmic history.
2. Examine the function of the eye (acuity and visual field) .
3. Measuring the intra-ocular pressure
4. Test pupillary reaction .
5. Examine eye movements .
6. Examine the different structure of the eye .
7. Use the ophthalmoscope

History

A good history must include detail of:

- Ocular symptoms, time of onset, eye affected and associated non ocular symptoms.
- Past ocular history.
- Past medical history.
- Drug history
- Family history.
- Presence of allergy

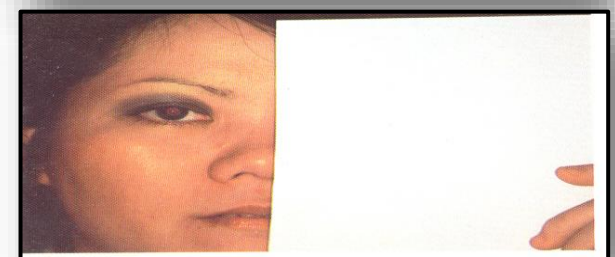
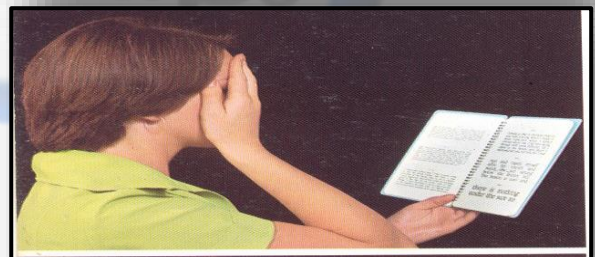
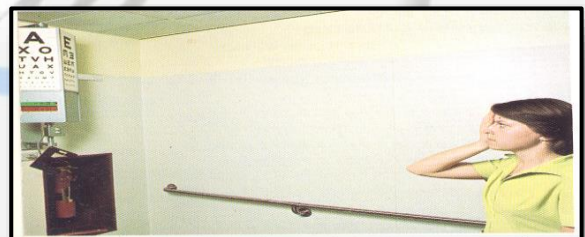
Examination Of The Eye

- Ophthalmic diagnosis is heavily Depent on a good histoty and athorough examination.
- The majority of ophthalmic diagnosis Do not require additional tests.
- Both structure and function of the eye are examined.

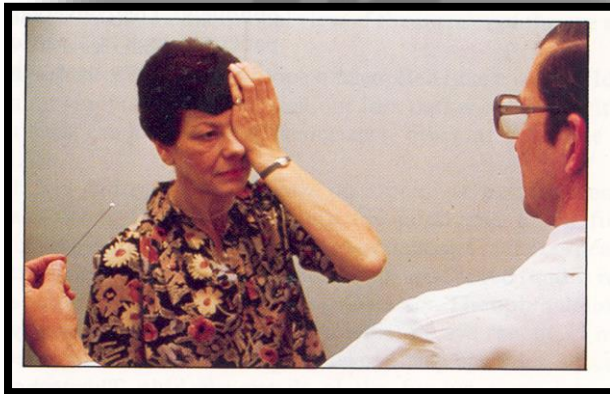
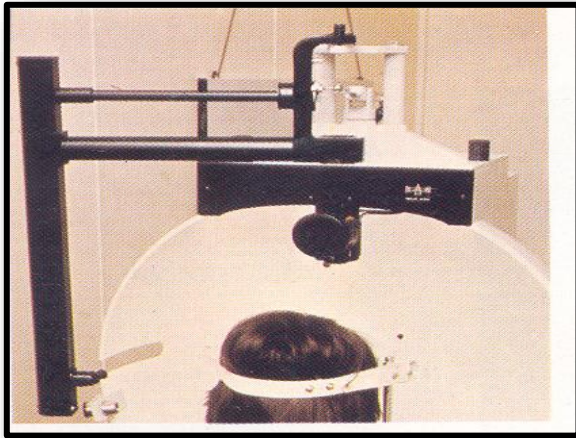
Physiological Testing Of The Eye

1. Visual acuty:

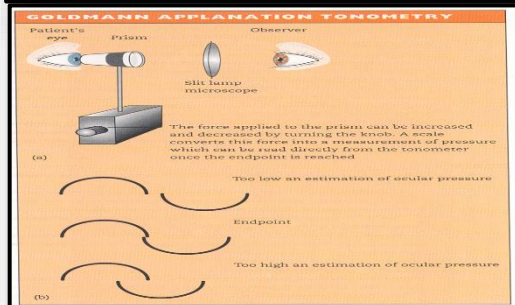
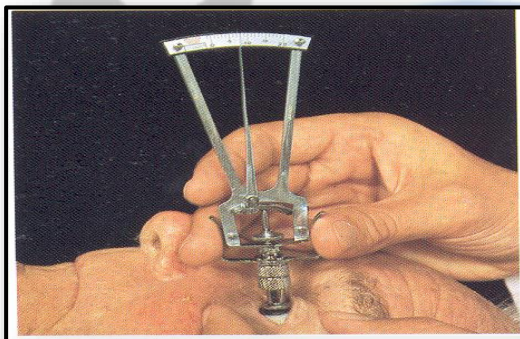
- Adults.
- Children



2. Visual fields
- Confrontation tests
 - Perimeters.



3. Intra ocular pressure

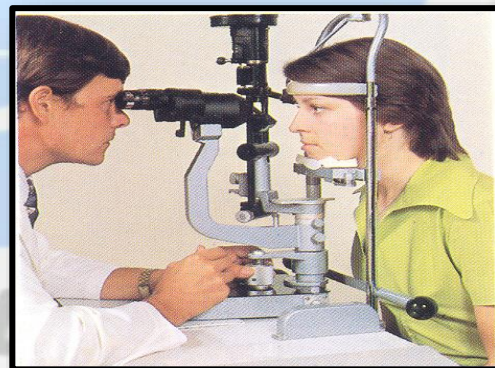


4. pupillary reaction

Anatomical Examination Of The Eye

A. External Examination:

1. head and face
2. bony orbit.
3. adnexia.
 - Lids.
 - L. A.
 - Conj.
 - E.O.M.
4. Eyeball
 - Cornea
 - Sclera
 - A. C
 - Iris
 - Pupil
 - Lens



B. Internal Examination :

Funduscopy:

- Direct ophthalmoscope.
- Indirect ophthalmoscope.

DESCRIPTION OF THE FUNDUS

Optic disc

- Colour — Pink, temporal side usually paler.
- Margin — Sharp and flat. Nasal margin may be relatively blurred and raised (in hypermetropia). Many normal variations including pigmentation and myopic crescent.
- Cup — Varies in size and depth. Situated at centre of disc and slopes temporally. Cup/disc ratio — is ratio of diameter of cup and that of optic disc.

Retinal vessels

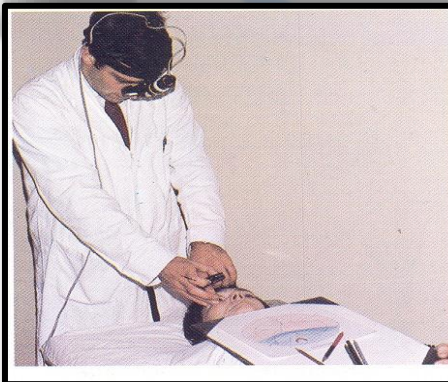
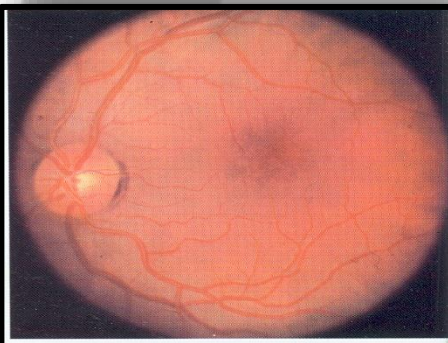
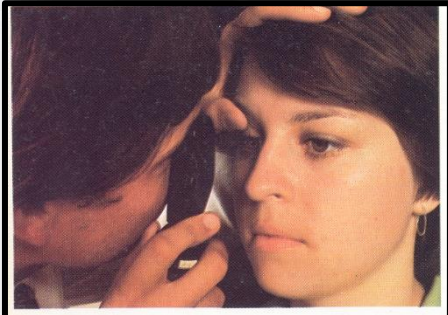
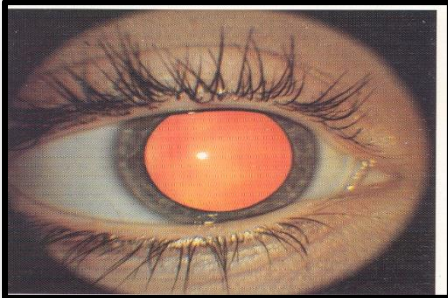
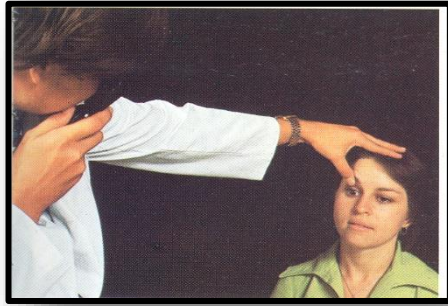
- Colour — Arteries lighter than veins.
- Diameter — Arteries narrower than veins. Ratio approximately 2:3.
- Crossing — Arteries cross anterior to veins at arterio-venous crossings.

Fundus background

- Colour — Red fundal background because of the choroidal vessels and retinal pigment layer. Darker in pigmented races. In lightly pigmented persons, large choroidal vessels seen against the white sclera. (rescattered fundal appearance) in myopia.

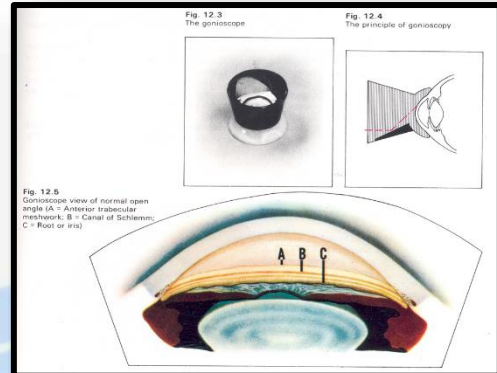
Macular area

- Colour — Normally darker than rest of fundus. At centre, normal foveal light reflex.



3) ESPICIAL EXAMINATION TECHNIQUE

1. Diagnostic lens: a gonioscopic lens
2. Retinoscopy



4) Investigative Techniques

1. Ultrasound.
2. Keratometry
3. Synaptophore
4. Exophthalmometer
5. Electrophysiological Tests
6. Radiological Imaging Techniques.
7. Flurescein Angiography

Thank You

~SCLERA

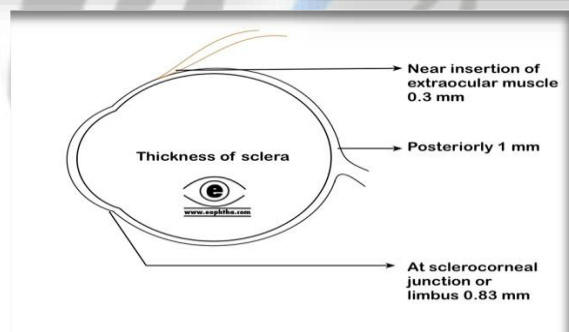
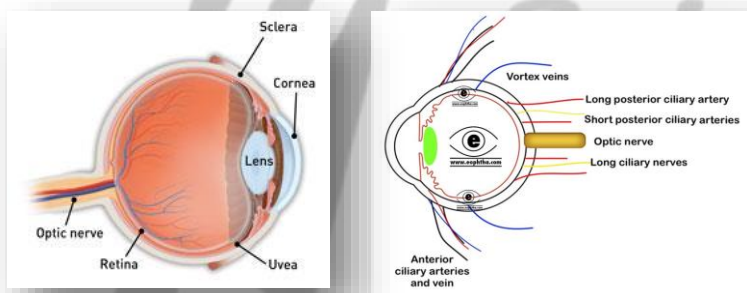
Dr .Ahmed M .Al-Asbahi
Ass.prof .Faculty of Medicine
Sanaa University

SCLERA

- The term sclera is derived from Greek word scleros ; meaning “hard”
- The sclera is the opaque, fibrous, protective outer layer of
- The eye, containing collagen and elastic fibers. It is continuous with cornea anteriorly and the dural sheaths of optic nerve posteriorly.
- The sclera originates from mesoderm

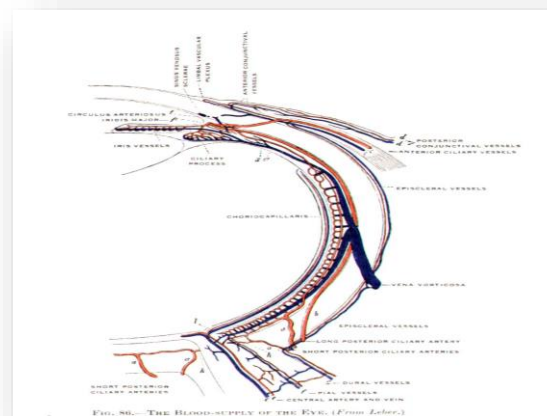
Thickness of the sclera

- Near the optic nerve = 1mm.
- At the equator = 0.5mm
- Behind the insertions of the recti muscles = 0.3mm.



The sclera is pierced by other groups of aperture

- *The Posterior apertures around the optic nerve – passing the long and short ciliary vessels and nerves.*
- *The middle apertures located 4mm behind the equator, transmit the exiting vortex veins leaving the choroids.*
- *The anterior apertures at the insertions of the recti, transmit the anterior ciliary arteries and nerves.*



Structures Of Sclera:

- The sclera consists of three layers:
 1. Episclera.
 2. Sclera proper (stroma)
 3. Lamina Fusca.

Episclera:

Thin layer consists of loose connective and elastic tissue lie below the conjunctiva and has a rich blood supply from anterior ciliary arteries.

Sclera proper (stroma):

- It is made up of collagen fibrils and irregularly arranged elastic fibers, it is relatively a vascular and poorly innervations.

The innermost layer (lamina fusca):

- Contains a number of melanocytes and some collagen connections with overlying choroids

- **The insertion of recti muscles:**

1. Medial at 5.5mm from the limbus,
2. Inferior 6.5mm.
3. Lateral 7.0mm.
4. Superior 7.7mm.

Blood and nerves supply of sclera

- *Anterior ciliary arteriers and posterior ciliary arteries (long and short) .*
- *Veins : anterior ciliary veins .*
- *Nerves : short and long ciliary nerves .*

Functions Of Sclera

- Protect the eye from the many injuries that might happen.
- Maintain the shape of eye.
- Provides an attachment for the extraocular muscles

DISEASES OF THE SCLERA

I. Inflammation:

1. Episcleritis.
2. Scleritis.

II. Congenital.

III. Metabolic.

IV. Degenerative.

V. Neoplastic disease.

Episcleritis:

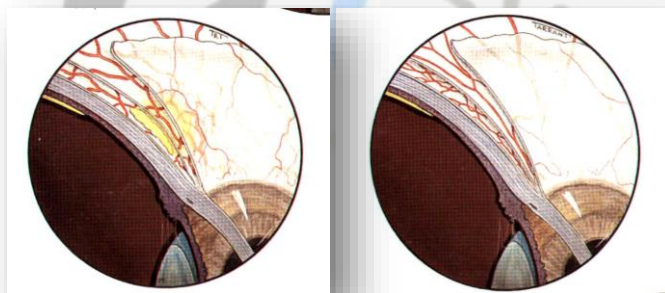
- Episcleritis is an inflammatory condition affecting the deep sub-conjunctiva connective tissues, including the superficial scleral lamella.
- It is usually benign, self-limiting, recurrent disease that typically affects young adults.

Causes of episcleritis:

- Most cases are idiopathic.
- One third of cases associated with systemic diseases such as rheumatoid arthritis, Sjogren's syndrome, ankylosing spondylitis, syphilis, herpes zoster, tuberculosis and gout.

Episcleritis

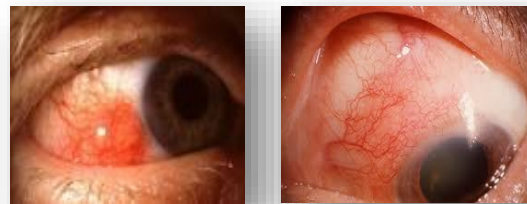
Normal



Clinical Types Of Episcleritis:

- Two clinical types of episcleritis:
 1. Simple episcleritis (localized or diffuse) .—This is the most common types of episcleritis ,the inflammation is usually mild and resolves spontaneously after two to three weeks .**N.B** Characterized by sectorial or diffuse injection of the bulbar conjunctive.

2. Nodular episcleritis . —This is often more painful than simple episcleritis and last longer. It is frequently related to underlying health condition such rheumatoid arthritis , lupus **N.B** Characterized by freely moveable nodule with surrounding injection usually 2-3mm from the limbus



Symptoms Of Episcleritis:

1. Redness of the eye.
2. Mild to-moderate discomfort.
3. Photophobia.
4. Lacrimation
5. Tenderness on pressure.

Treatment Of Episcleritis:

1. Simple episcleritis often requires no treatment.
2. Patients with severe or prolonged episodes may require artificial and/or topical corticosteroid.
3. Nodular episcleritis may require local corticosteroid drops.
4. If nodular episcleritis is unresponsive to topical therapy, systemic non-steroid anti-inflammatory drugs (NSAIDs).

Scleritis:

- Scleritis is a severe, destructive, vision-threatening inflammation involving the deep episclera and sclera.
 - Usually affecting both eyes.
 - Most frequently in women.
 - Less common of episcleritis.
 - It occurs in older age group.

Scleritis

Scleritis



Causes of Scleritis:

- I. Scleritis may occur isolated (43%).
- II. Associated with systemic diseases:-
 - A. Autoimmune diseases (48%):
 1. Ankylosing spondylitis
 2. Rheumatoid arthritis
 3. Polyarteritis nodosa
 4. Relapsing polychondritis
 5. Wegen's granulomatosis
 6. Systemic lupus erythematosus
 7. Ulcerative colitis
 8. IgA nephropathy
 9. Psoriatic arthritis
 - B. Granulomatous diseases:
 1. Tuberculosis
 2. Syphilis
 3. Sarcoidosis
 4. Leprosy
 5. Vogt-koyanagi-Harada syndrome
 - C. Metabolic disorders:
 1. Gout, thyrotoxicosis.
 - D. Infections (7%):
 1. Onchocerciasis, toxoplasmosis, herpes zoster, herpes simplex, infections with pseudomonas, streptococcus, staphylococcus.
 - E. Others (2%):
 1. Physical (irradiation, thermal burns)
 2. Chemical
 3. Mechanical (penetrating injuries).

Symptoms of scleritis

- Severe penetrating pain that radiates to the forehead, brow or sinus.
 1. Watering.
 2. Photophobia.
 3. Redness.
 4. Decreased visual acuity

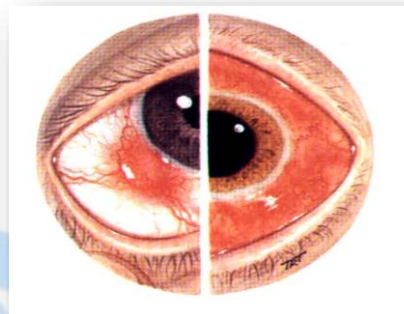
Classification of scleritis:

- I. Anterior scleritis (90% of cases).
 1. Anterior scleritis diffuse.
 2. Nodular.
 3. Necrotizing with inflammation or without inflammation (scleromalacia perforans).
- II. Posterior scleritis (10% of cases).

Diffuse Anterior Scleritis:

- It is the most common type of scleritis
- It accounts for about 50% of scleritis cases
- The inflammation is more wide spread involving either a segment of the globe or the entire anterior sclera

Non-necrotizing scleritis. Left: nodular; right: diffus

**Nodular Anterior Scleritis**

- Characterized by presence one or more nodules in the sclera
 - Less circumscribed than episcleritis
 - First dark red or bluish red later becomes purple and semitransparent like porcelain

Nodular scleritis

**Necrotizing anterior scleritis :**

- It's the most severe form of anterior scleritis. It has the ability to destroy scleral tissues and in rare cases may lead to loss of the eye(s). This form is typically characterized by extreme pain and tenderness it's commonly associated with underlying systemic disease.

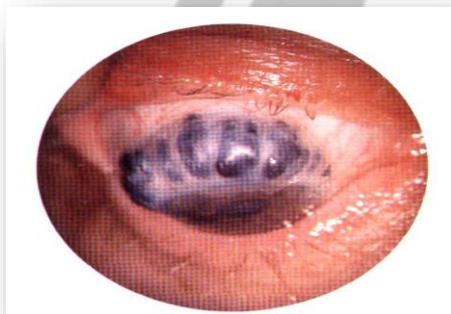


Necrotizing scleritis without inflammation (scleromalacia perforans):

- Patients with seropositive rheumatoid arthritis. and melting Pain less scleral thinning .

Posterior Scleritis

- The rarer form, and often is not related to an underlying systemic disorder. Posterior scleritis can develop on its own or with the anterior form of scleritis. It can present with severe eye pain and tenderness
- Posterior segment signs include vitritis, disc swelling, exudative retinal detachment.



Diagnosis of scleritis:

I. History:

- The major complaint, the past history including infections, injury, or surgery.
- Review of systemic diseases.

II. Physical examination:

- Scleral examination.
- General eye examination.

III. Lab studies:

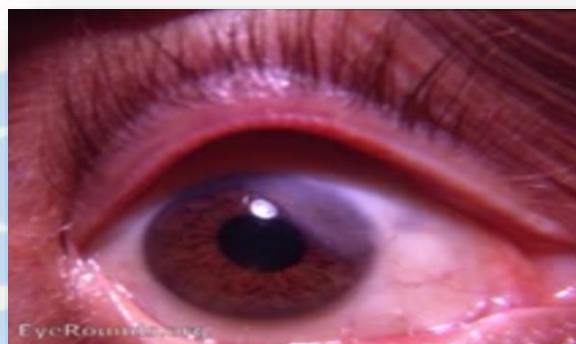
- Based on the past history, review of systems and physical examination.

IV. Imaging studies:

- Chest x-ray, sinus film, sacroilica x-ray.
- Ultrasonography – for posterior scleritis.
- MRI – for posterior scleritis.

Complication of scleritis:

1. Diffuse stromal keratitis.
2. Sclerosing stromal keratitis.
3. Deep keratitis.
4. Uveitis – anterior or posterior.
5. Glaucoma.
6. Cataract.
7. Retinal detachment.
8. Optic neuritis.



Treatment of scleritis:

1. Medical Treatment:

- **Diffuse or nodular scleritis:**

The initial therapy consists of (NSAIDs)

- ✓ If NSAIDs are not effective, oral corticosteroid with continued NSAIDs
- ✓ Immunosuppressive drugs if failure of corticosteroid

- **Necrotizing scleritis:**

- ✓ The initial therapy consists of immunosuppressive drugs.

- **Infections scleritis:**

- ✓ Systemic treatment with or without topical antimicrobial.

2. Surgical Treatment:

- ✓ Scleral graft may be required for cases with pending perforation.
- ✓ Keratoplasty used for associated corneal diseases.

Blue sclera

- Structural changes of the scleral collagen fibers and thinning of the sclera may allow the underlying uveal pigment to be seen, giving the sclera a bluish discoloration.



Causes of Blue scleras :

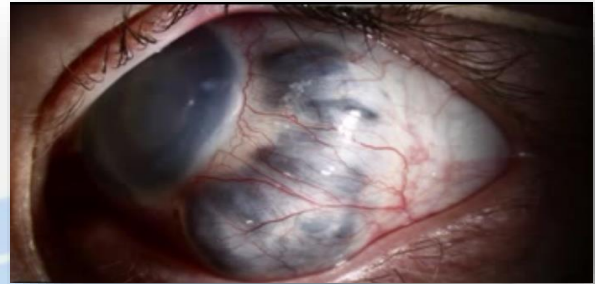
1. Blue sclera are sometimes noted in normal newborn infants.
2. Keratoconus, Keratoglobus.
3. Scleral staphyloma.
4. Buphthalmous.
5. Connective tissue and collagen diseases, such as:
 - a) Osteogenesis imperfecta.
 - b) Ehler-danals syndrome.
 - c) Marfan's syndrome.
 - d) Pseudohypoparathyroidism.
 - e) Pseudoxanthoma elasticum.
6. Prolonged use of corticosteroids.

Staphyloma

- Staphyloma results from bulging of the uveal into ecstatic sclera.

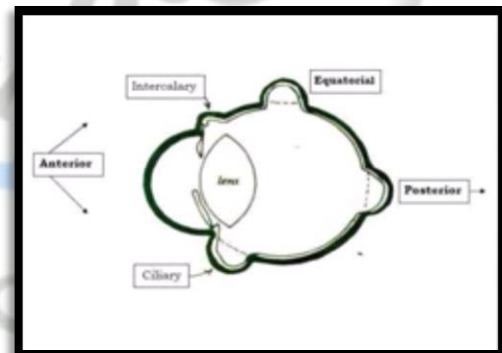
Pathogenesis:

- Weak outer coat of the eye (cornea and sclera) due to trauma or disease.
- Increase intraocular pressure.



Clinical types of ocular staphyloma:

1. Anterior staphylomas:
 - a) Ciliary staphyloma.
 - b) Intercalary staphyloma.
2. Equatorial staphyloma.
3. Posterior staphyloma - most commonly seen at the optic nerve head.



TANK YOU

~ ORBIT

Dr. Samyha Al Iryani

12th. Jan. 2019

Learning Objective:

- To understand the Symptoms , Signs , Causes and Investigation of Orbital disease

THE ORBITAL CAVITY

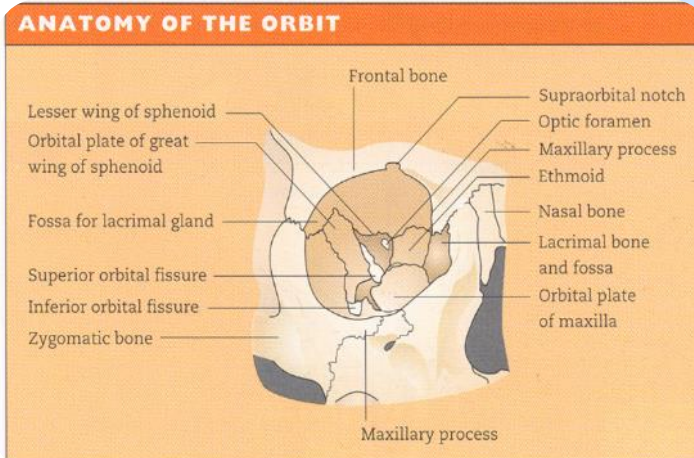
A pair of large bony socket each cavity is a pear –shaped composed of seven bones.

The orbital walls are four: roof ,floor, medial and lateral walls.

1- The Optic Canal.

2- The Superior Orbital Fissure.

3- The Inferior Orbital Fissure



Orbital Cellulitis

- Infection behind orbital septum
- Usually secondary to ethmoiditis
- Presentation - severe malaise, fever and orbital signs

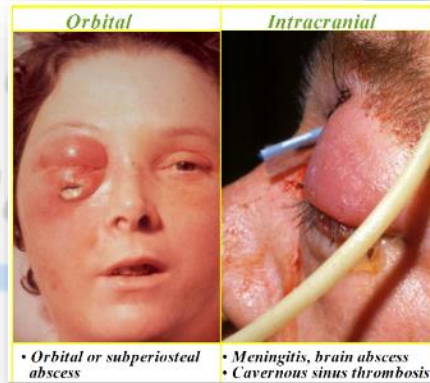
Signs



- Severe eyelid oedema and redness
- Proptosis - most frequently lateral and down
- Painful ophthalmoplegia
- Optic nerve dysfunction if advanced

Complications Of Orbital Cellulitis

- Raised intraocular pressure
- Retinal vasculature occlusion
- Optic neuropathy



Management Of Orbital Cellulitis

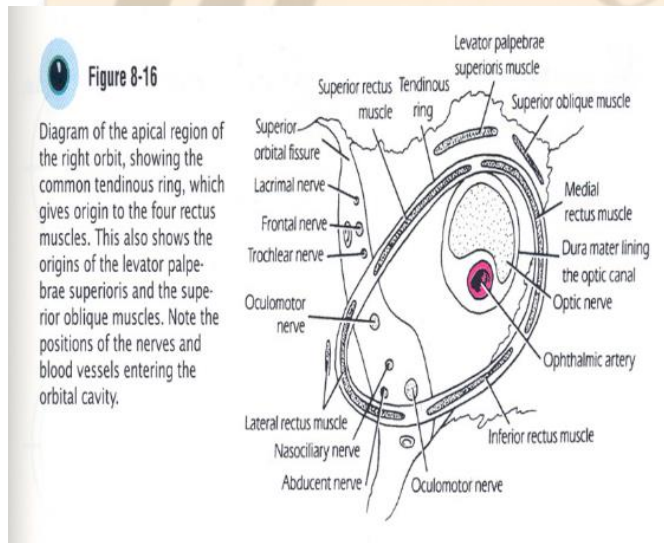


Pre-treatment



Post-treatment

- Hospital admission
- Systemic antibiotic therapy
- Monitoring of optic nerve function
- Indications for surgery
 - Resistance to antibiotics
 - Orbital or subperiosteal abscess
 - Optic neuropathy



ORBITAL INFECTIONS AND INFLAMMATIONS

- Orbital cellulitis
- Idiopathic orbital inflammatory disease (IOID)
- Dacryoadenitis
- Orbital myositis

Idiopathic Orbital Inflammatory Disease (IOID)

- Non-neoplastic, non-infectious orbital lesion (pseudotumour)
- Involves any or all soft-tissue components
- Presentation - 20 to 50 years with abrupt painful onset



- Usually unilateral
- Periorbital swelling and chemosis
- Proptosis
- Ophthalmoplegia

Clinical Course And Treatment Of IOID

1. Early spontaneous remission without sequelae
Treatment - nil

2. Prolonged intermittent activity with eventual remission
Treatment options - steroids, radiotherapy or cytotoxics

3. Severe prolonged activity causing a 'frozen orbit'



Left involvement resulting in ophthalmoplegia and ptosis

Dacryoadenitis

- Occurs in 25% of patients with IOID
- Usually affects otherwise healthy individuals - no treatment required
- Presentation - acute discomfort over lacrimal gland



- Oedema of lateral aspect of upper lid
- Mild downward and inward globe displacement
- Injection and tenderness of palpebral lobe of lacrimal gland
- Reduction in tear secretion

Orbital Myositis

- Subtype of IOID
- Involvement of one or more extraocular muscles
- Clinical course is usually short - treat with NSAIDs
- Presentation - sudden onset of pain on ocular movement



- Underaction of left lateral rectus
- Worsening of pain on attempted left gaze
- CT shows fusiform enlargement of left lateral rectus

Thyroid Eye Disease

1. Soft tissue involvement

- Periorbital and lid swelling
- Conjunctival hyperaemia
- Chemosis
- Superior limbic keratoconjunctivitis

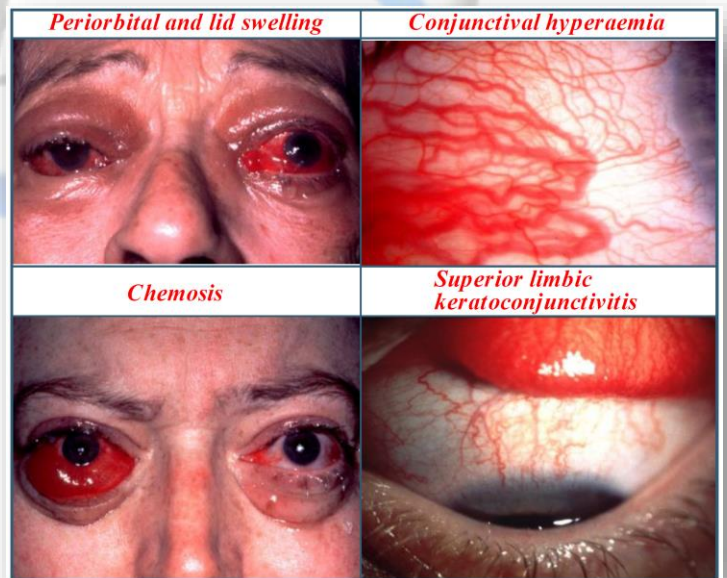
2. Eyelid retraction

3. Proptosis

4. Optic neuropathy

5. Restrictive myopathy

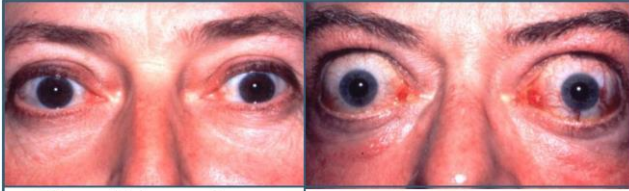
Soft Tissue involvement



Eye Lid Retraction

Signs of eyelid retraction

Occurs in about 50%



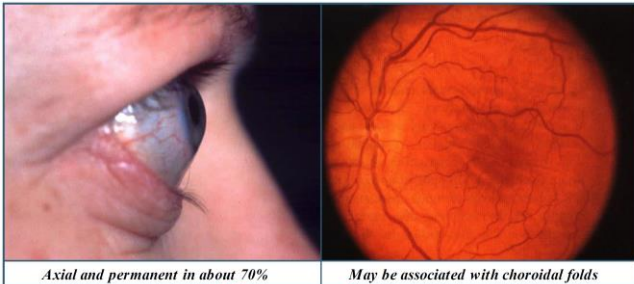
- Bilateral lid retraction
- No associated proptosis
- Bilateral lid retraction
- Bilateral proptosis



- Unilateral lid retraction
- Unilateral proptosis
- Lid lag in downgaze

Proptosis

- Occurs in about 50%
- Uninfluenced by treatment of hyperthyroidism



Axial and permanent in about 70%

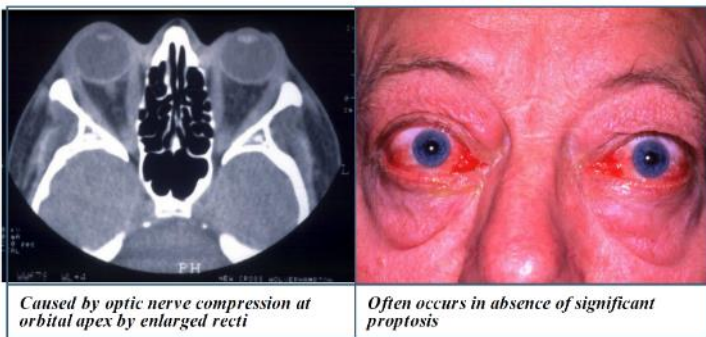
May be associated with choroidal folds

Treatment options

- Systemic steroids
- Radiotherapy
- Surgical decompression

Neuropathy

- Occurs in about 5%
- Early defective colour vision
- Usually normal disc appearance



Caused by optic nerve compression at orbital apex by enlarged recti

Often occurs in absence of significant proptosis

Restrictive Myopathy

- Occurs in about 40%
- Due to fibrotic contracture



Elevation defect - most common

Abduction defect - less common

Depression defect - uncommon

Adduction defect - rare

CYSTIC ORBITAL LESIONS

1. Dacryops

2. Dermoid cyst

- Superficial
- Deep

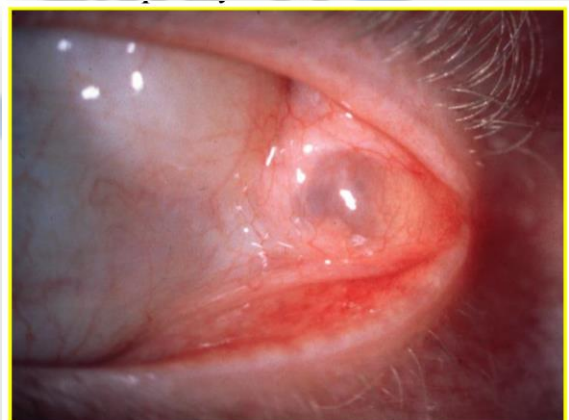
3. Mucocele

4. Encephalocele

- Anterior
- Posterior

Dacryops

- Ductal cyst of lacrimal gland
- Frequently bilateral



- Round, cystic lesion originating from palpebral portion of lacrimal gland
- Protrudes into superior fornix

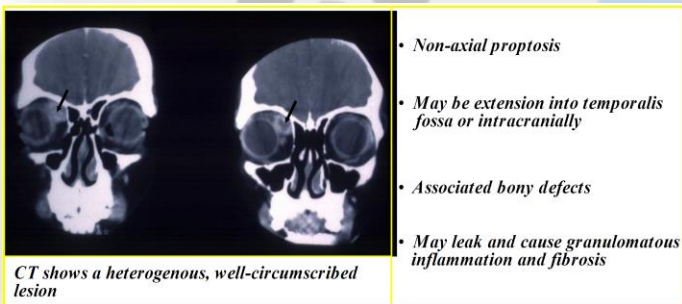
Superficial dermoid cyst

- Presents in infancy
- No displacement of globe



Deep dermoid cyst

- Presents in adolescence or adult life

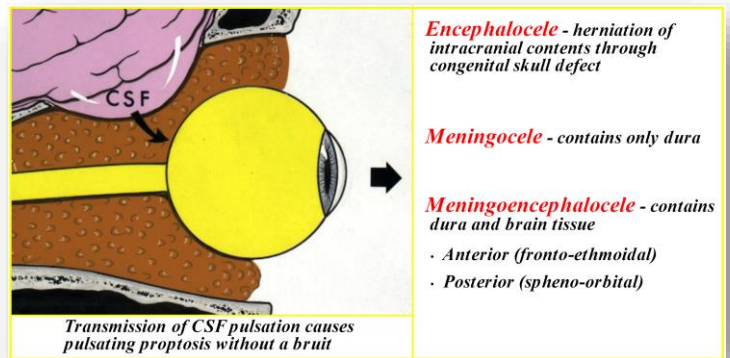


Mucocele

- Presents - adult life
- Caused by obstruction of drainage of normal sinus secretions (frontal or ethmoidal)
- Slowly expanding lesion which gradually erodes sinus walls



Encephalocele

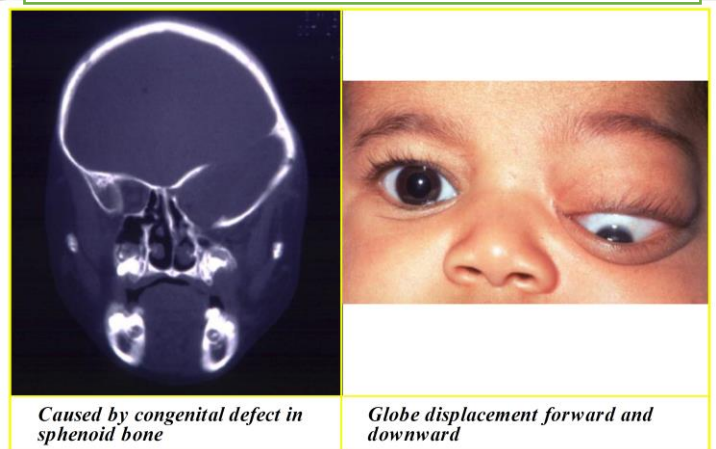


Anterior Encephalocele



- Involves supero-medial part of orbit
- Displaces globe forwards and laterally

Posterior Encephalocele



Ocular	Other congenital bony defects	Neurofibromatosis - I
		
- Colobomas - Morning glory anomaly	- Hypertelorism - Have lip and cleft palate	Common in posterior encephalocele

ORBITAL TUMOURS

- Vascular tumours**
 - Capillary haemangioma
 - Cavernous haemangioma
- Lacrimal gland tumours**
 - Pleomorphic adenoma
 - Carcinoma
- Neural tumours**
 - Optic nerve glioma
 - Optic nerve sheath meningioma
 - Sphenoidal ridge meningioma
- Miscellaneous tumours**
 - Lymphoma
 - Rhabdomyosarcoma
 - Metastases
 - Invasion from sinuses

Capillary Haemangioma

- Most common orbital tumour in children
- Presents - 30% at birth and 100% at 6 months



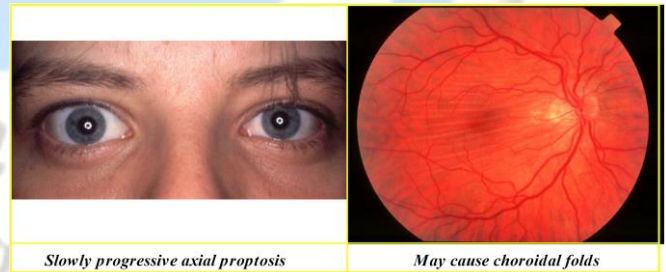
- Most commonly in superior anterior orbit
- May enlarge on coughing or straining
- Associated 'strawberry' naevus is common

Capillary Haemangioma

Natural history	Systemic associations
	- High output cardiac failure - Kasabach-Merritt syndrome - thrombocytopenia, anaemia - Maffucci syndrome - skin haemangiomas, enchondromata
Treatment	
	- Steroid injections - for superficial component - Systemic steroids - Local resection - difficult
- Growth during first year - Subsequent resolution - complete in 70% by age 7 years	

Cavernous Haemangioma

- Most common benign orbital tumour in adults
- Usually located just behind globe
- Female preponderance - 70%
- Presents - 4th to 5th decade

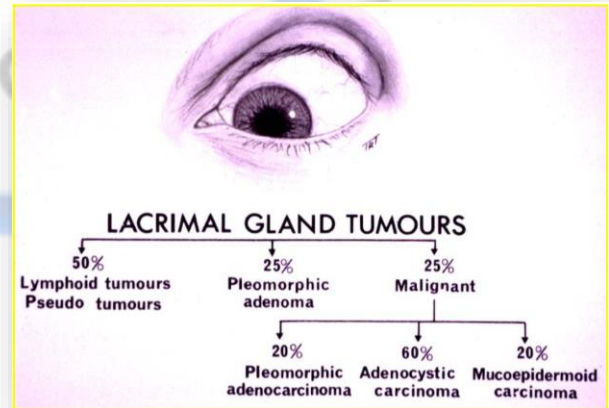


Slowly progressive axial proptosis

May cause choroidal folds

Treatment - surgical excision

Classification Of Lacrimal Gland Tumours



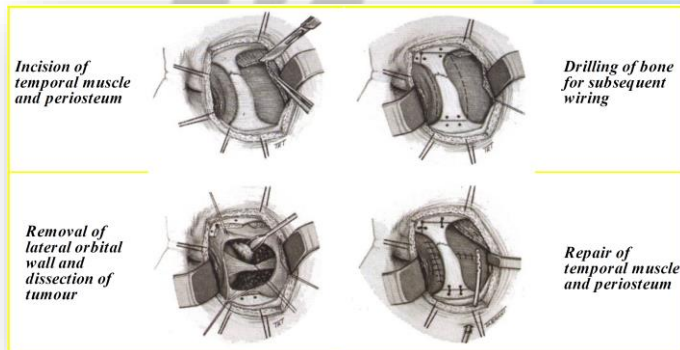
Pleomorphic Lacrimal Gland Adenoma

Presents - 4th to 5th decade



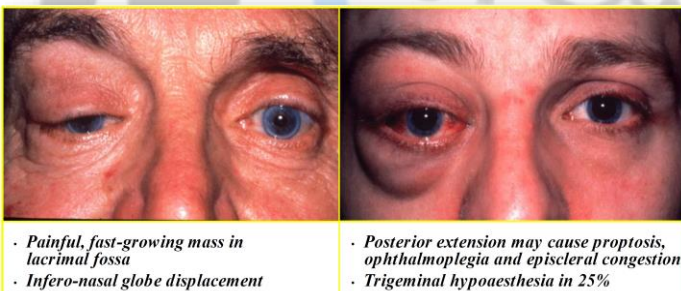
Technique of surgical excision

- Biopsy is contraindicated
- Prognosis - good if completely excised



Lacrimal gland carcinoma

- Presents - 4th to 6th decades
- Very poor prognosis



Management

- Biopsy
- Radical surgery and radiotherapy

Optic nerve glioma

- Typically affects young girls
- Associated neurofibromatosis - 1 is common
- Presents - end of first decade with gradual visual loss.

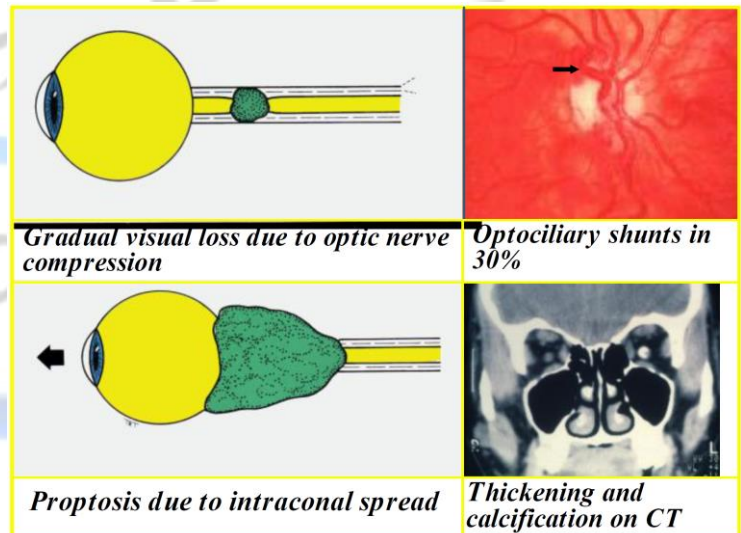


Treatment

- Observation - no growth, good vision and good cosmesis
- Excision - poor vision and poor cosmesis
- Radiotherapy - intracranial extension

Optic nerve sheath meningioma

Typically affects middle-aged women

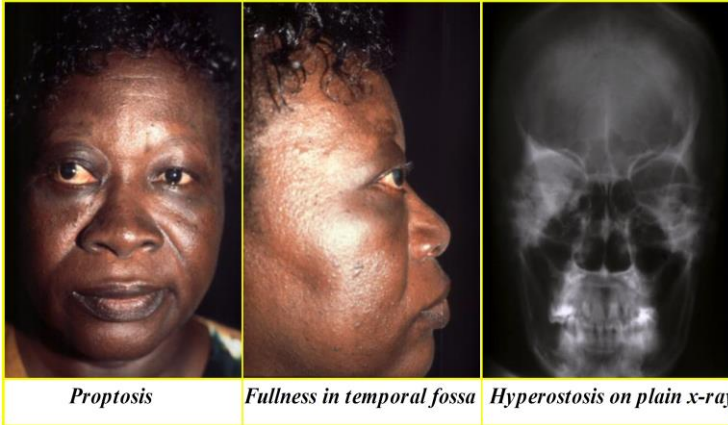


Treatment

- Observation - slow-growing tumours
- Excision - aggressive tumours and poor vision
- Radiotherapy - slow-growing tumours and good vision

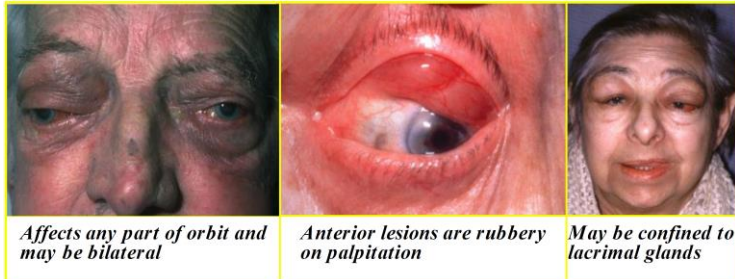
Sphenoidal Ridge Meningioma

Presents with gradual visual loss and reactive hyperostosis



Lymphoma

Presents - 6th to 8th decades

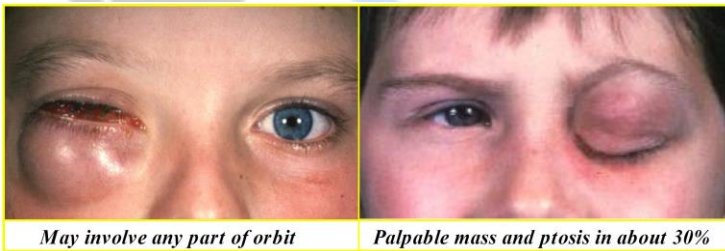


Treatment

- Radiotherapy - localized lesions
- Chemotherapy - disseminated disease

Rhabdomyosarcoma

- Most common primary childhood orbital malignancy.
- Rapid onset in first decade (average 7 yrs).



Treatment

- Radiotherapy and chemotherapy
- Exenteration for radio-resistant or recurrent tumours

Childhood Metastatic Tumours

Neuroblastoma



- Presents in early childhood
- May be bilateral
- Typically involves superior orbit

Chloroma



- Presents at about age 7yrs
- Rapid onset proptosis - may be bilateral
- Subsequent systematic dissemination to full-blown leukaemia

Adult Metastatic Tumours

- Common primary sites - breast, bronchus, prostate, skin melanoma. gastrointestinal tract and kidney

Presentations



Anterior orbital mass with non-axial globe displacement



Enophthalmos with sclerotic tumours



Similar to orbital pseudo-tumour



Cranial nerve involvement at orbital apex and mild proptosis

Orbital Invasion By Sinus Tumours

Maxillary carcinoma



Upward globe displacement and epiphora

Ethmoidal carcinoma



Lateral globe displacement

MCQ

A 56 – year –old female patients with a proptosed eye deviated nasally

a An eye displaced to one side of the orbit suggests an extra- canal lesion.

b Rapid onset of Proptosis might suggest a malignant tumour.

c. The patient may have dysthyroid eye (Graves') disease.

d. The patient may have a rhabdomyosarcoma of the extra Ocular muscles

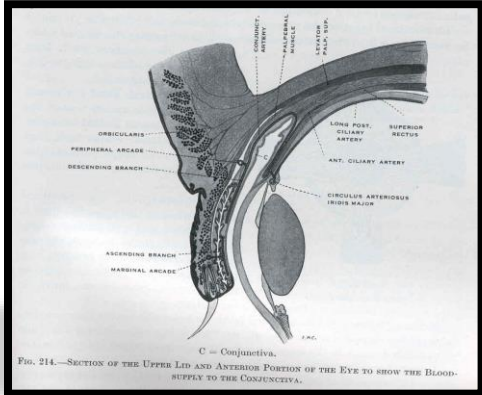
Eyelids

Dr AMAL NOMAN AL-DBHANY

MD, FRCS OPHTHALMOLOGY

Faculty of Medicine, Sana'a University

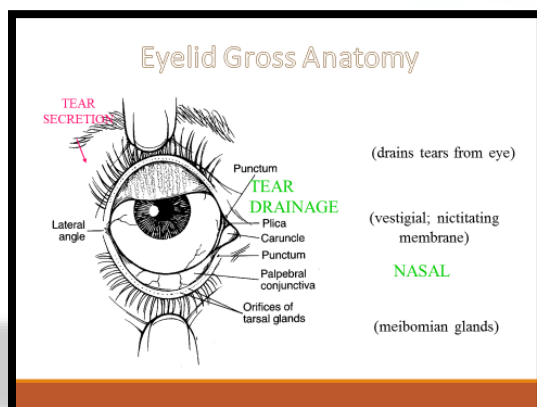
Eyelids



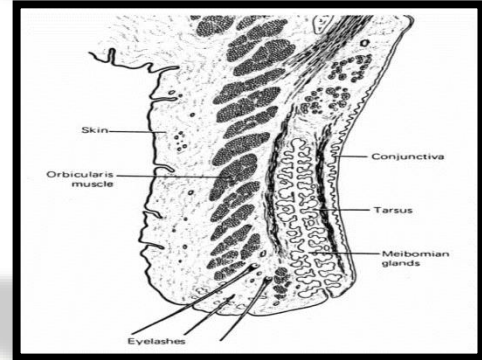
EYELIDS - FUNCTIONS

- Lids, lashes and eyebrow (with the bony orbit) → primary protection mechanism for the globe from the external environment
- Eyelids provide both physical and physiological protection for the eyes
- Several tear film components are provided by glands in the eyelids
- Blinking resurfaces and replenishes the precorneal tear film
- Eyelids actively excrete the tears via the lacrimal pump

Eyelid Gross Anatomy



UPPER EYELID (cross-section)



Skin

- The skin is very thin and easily to fold .
- Microscopic examination of skin show many small hair with sebaceous gland.
- The epidermis contain neoumerous melanocytes.
- The eye lashes are short ,thick,curved more numerous in the U.L (150 in U.L-75 in L.L)replaced every 100-150 days.
- The sebaceos gland of zeis open into each follicle.
- Behind&between each follicle modified sweat gland ,the ciliary gland of moll ,open into the hair follicle or in lid margin.

Subcutaneous tissue

- S.C tissue is very loose and rich in elastic fibers ,in white its almost devoid of fat .

MUSCLES OF THE EYELID

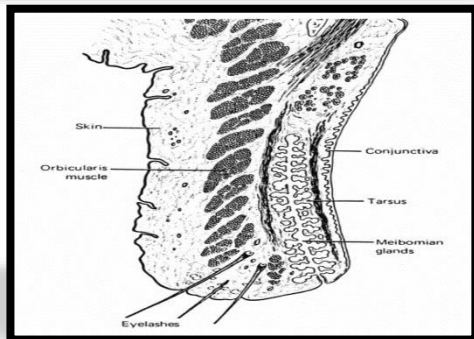
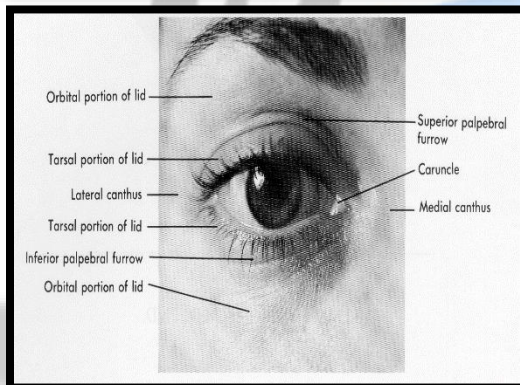
- *Levator palpebrae superioris*
- *Muller's muscle*
- *Orbicularis oculi*

POSETRIAOR PART OF EYELID

- **Tarsus:**

The skeleton of the lid contain in it the meibomian gland .

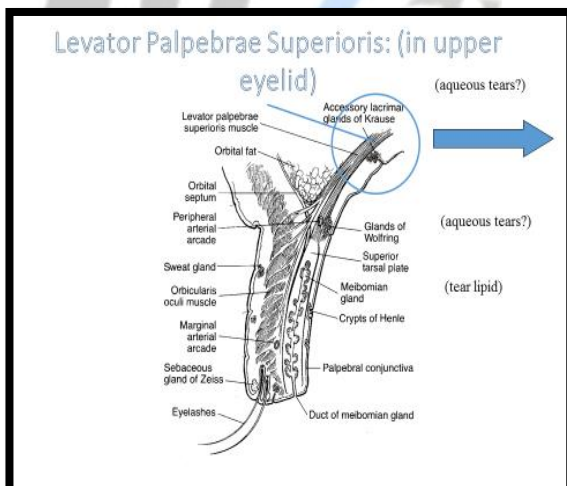
- **Palpebral conjunctiva**

UPPER EYELID (cross-section)**Eyelids: Landmarks****Levator Palpebrae Superioris**

- Striated muscle in upper lid (no counterpart in lower lid).

Innervated by NIII (oculomotor nerve - superior branch.)

- Main eyelid retractor

**Inflammation of the eyelids**

- **Dermatitis** : inflammation of the skin
- **Blepharitis** : inflammation of the lid margin

Dermatitis: inflammation of the skin**Dermatitis**

Dermatitis : Allergic disorders. (A) Acute allergic oedema; (B) contact dermatitis

Blepharitis

- Chronic blepharitis (chronic marginal blepharitis) is a very common cause of ocular discomfort and irritation.
- Blepharitis may be subdivided into anterior and posterior, although there is considerable overlap and both types are often present (mixed blepharitis).
- Squamous blepharitis {seborrhoeic}
- Ulcerative blepharitis {staphylococcal}
- Angular blepharitis
- Parasitic blepharitis

Signs of staphylococcal blepharitis

- Hard scales and crusting
- Mild papillary conjunctivitis
- Scarring and notching (tylosis) of the lid margin, madarosis, trichiasis and poliosis.
- Tear film instability and dry eye syndrome

Staphylococcal Blepharitis



Chronic anterior blepharitis: Scales and crusting including collarettes in staphylococci

Signs of seborrhoeic blepharitis

- Hyperaemic and greasy anterior lid margins with soft scales and adherence of lashes to each other



Greasy lid margin with sticky lashes in seborrhoeic

Signs of posterior blepharitis

- Excessive and abnormal meibomian gland secretion
- Pouting, recession, or plugging of meibomian gland orifices
- Hyperaemia and telangiectasis of the posterior lid margin.
- Pressure on the lid margin results in expression of meibomian toothpaste-like fluid
- The tear film is oily and foamy

Posterior Blepharitis

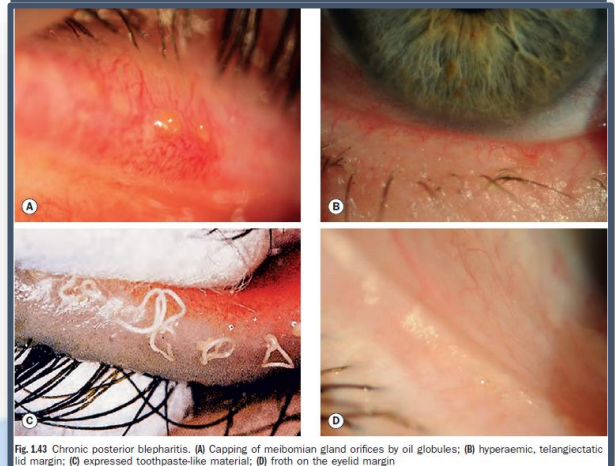


Fig. 1.43 Chronic posterior blepharitis. (A) Capping of meibomian gland orifices by oil globules; (B) hyperaemic, telangiectatic lid margin; (C) expressed toothpaste-like material; (D) froth on the eyelid margin

Phthiriasis Palpebrarum



Lice and nits clinging to the lashes in phthiriasis palpebrarum

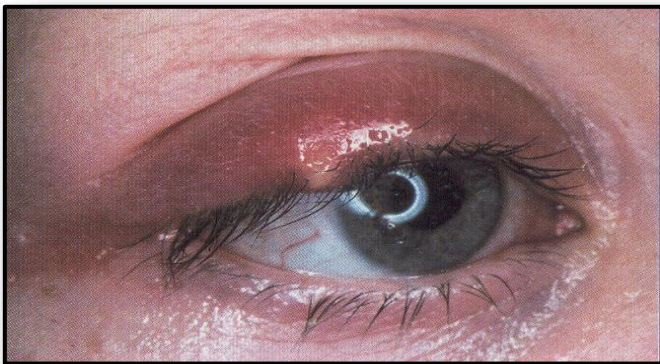
Treatment of blepharitis

1. **Lid hygiene :**
 - A warm compress
 - Lid cleaning
2. **Antibiotics :**
 - Topical sodium fusidic acid
 - Oral antibiotic regimens include doxycycline
3. **Tear substitutes**
4. **Topical steroid**

Inflammation of the glands of eyelids

1. **Stye:** acute staphylococcal abscess of a lash follicle and its associated gland of Zeis
2. **Chalazion**(meibomian cyst) : sterile chronic granulomatous inflammatory lesion(lipogranuloma) of the meibomian, or sometimes Zeis, glands caused by retained sebaceous secretions.

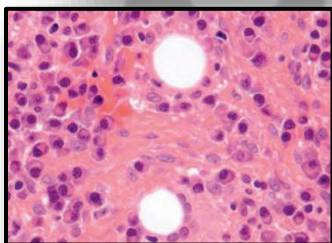
Stye (External Hordeolum)



Treatment of stye

- Treatment involves topical (occasionally oral) antibiotics, hot compresses and epilation of the associated lash.

Chalazion



Large pale cells are epithelioid cells



Conjunctival view of chalazion clamp in place prior to incision and curettage

Treatment of chalazion

1. Steroid ointment
2. Oral antibiotics
3. Conservative
4. Hot compress
5. Expression
6. Steroid injection
7. Surgery
8. Prophylaxis: Treatment of blepharitis

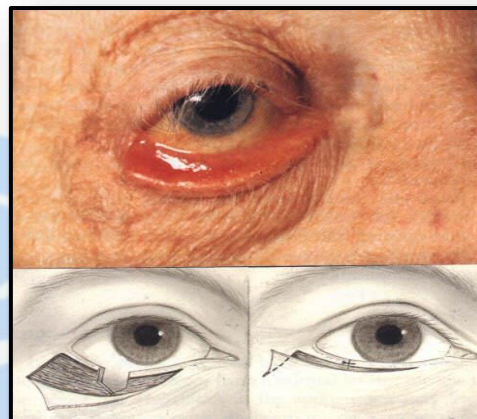
Ectropion (Turning out of Eyelids)

- Involutional ectropion
- Cicatricial ectropion
- Paralytic ectropion/facial nerve palsy
- Mechanical ectropion

Ectropion

Involutional (senile)

- Treated with repair of horizontal lid laxity.



Ectropion

Cicatricial:

- Lengthening of vertical skin deficiency, such as Z-plasty.
- Severe generalized cases require transposition flaps or free skin grafts.

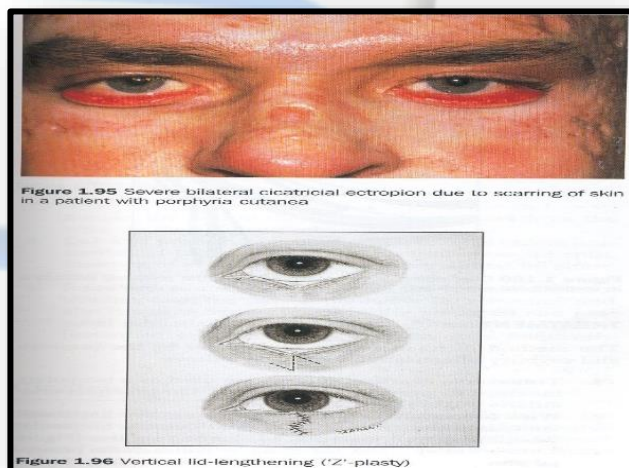


Figure 1.95 Severe bilateral cicatricial ectropion due to scarring of skin in a patient with porphyria cutanea

Figure 1.96 Vertical lid-lengthening ('Z'-plasty)

Ectropion

Paralytic:

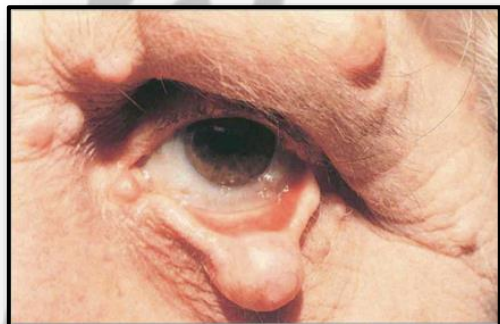
- Treatment if permanent includes Medial canthoplasty, lateral canthal tarsal strip or gold weight implantation in the upper lid.



Ectropion

Mechanical:

- Treatment involves removal of the cause if possible, and correction of significant horizontal lid laxity.

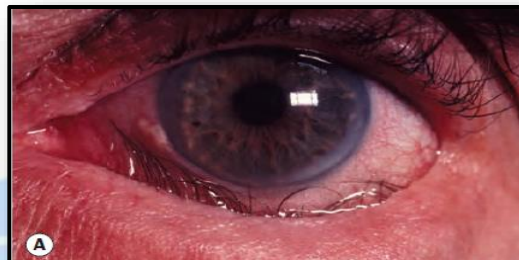


Entropion (Turning in of eyelids)

- Involutional entropion
- Cicatricial entropion

Involutional

- (age-related) entropion affects mainly the lower lid.
- The Wies procedure gives a durable correction.



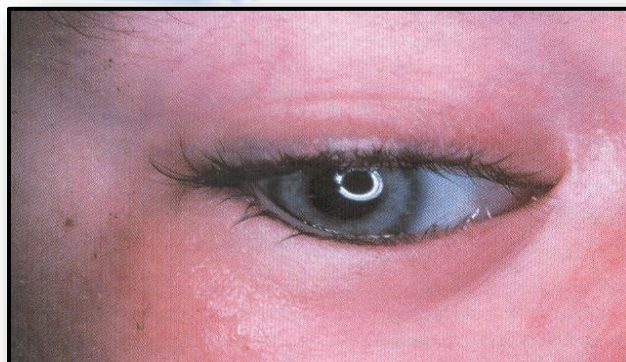
Involutional entropion and pseudotrichiasis

Cicatricial:

- Scarring of the palpebral conjunctiva can rotate the upper or lower lid margin towards the globe

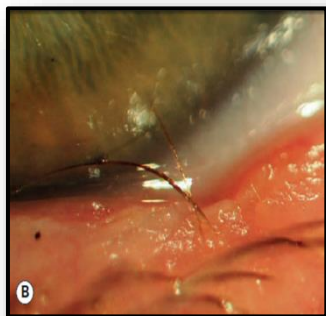


Entropion(Congenital)

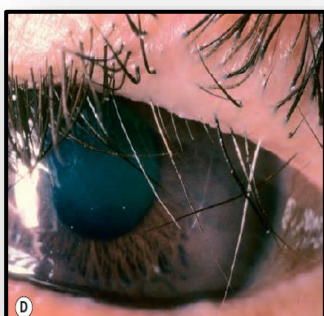


Trichiasis

Misdirection of eyelashes



Trichiasis associated with a lid notch



Acquired distichiasis

Trichiasis



Ptosis

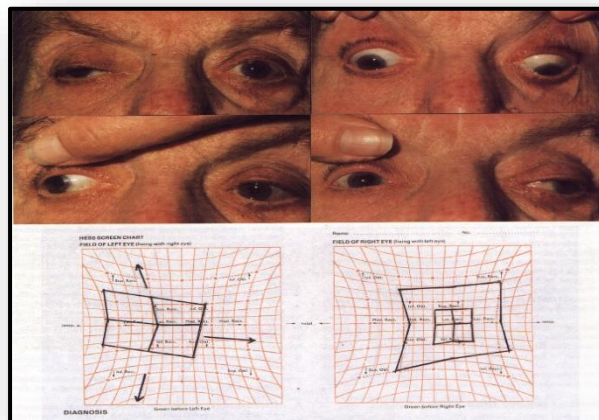
Abnormally low position of the upper lid; it may be congenital or acquired.

1. Neurogenic
2. Myogenic
3. Aponeurotic
4. Mechanical

Ptosis: Congenital



Ptosis: Paralytic



Ptosis: Mechanical

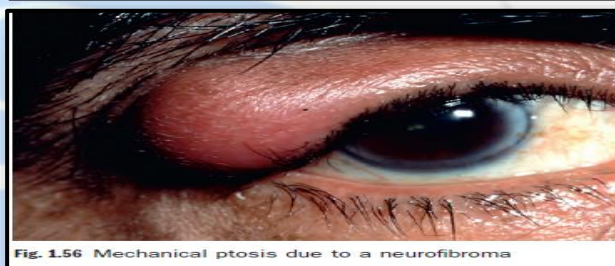


Fig. 1.56 Mechanical ptosis due to a neurofibroma

Involuntional ptosis



Fig. 1.55 Severe bilateral involuntional ptosis with absent skin creases and deep sulci

Ptosis: Examination

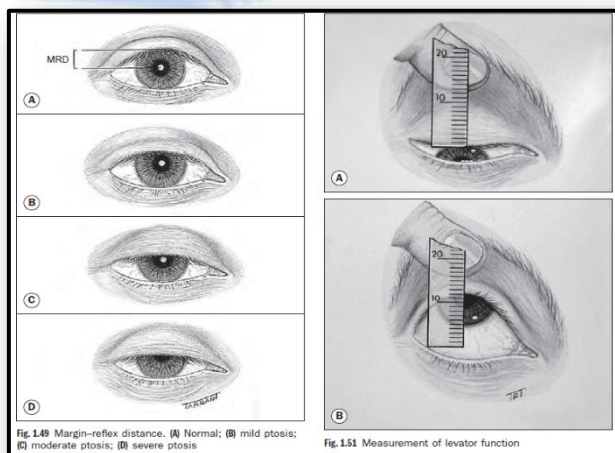
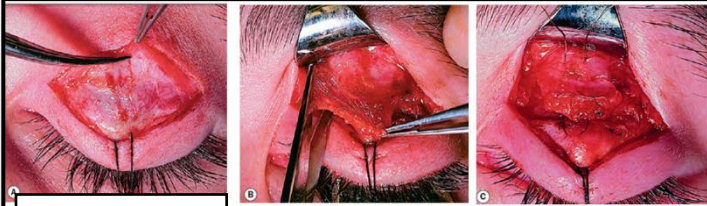


Fig. 1.49 Margin-reflex distance. (A) Normal; (B) mild ptosis; (C) moderate ptosis; (D) severe ptosis

Fig. 1.51 Measurement of levator function

Ptosis : Surgical correction



Levator resection



Sling operation

Pseudoptosis : Dermatochalasis

- False impression of ptosis



Fig. 1.48 Marked right dermatochalasis and brow ptosis

Madarosis:

- Absence of eyelashes



Poliosis:

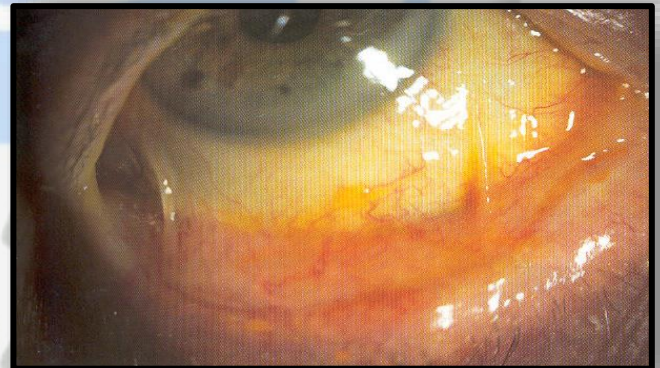
Whitening of eyelashes



Vitiligo and poliosis in Vogt-Koyanagi-Harada

Symblephron:

Adhesion between the lid and conjunctiva



THANK YOU

~ VISUAL PATHWAY

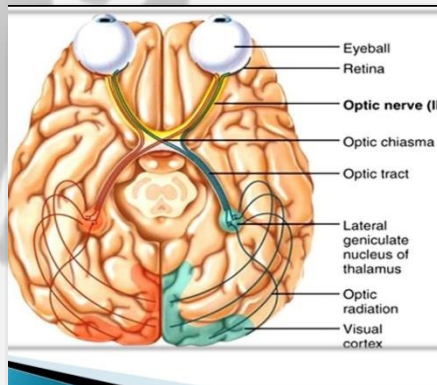
Dr. Mutahar Al-Shaer MD

- ❖ *Anatomy of different component of visual pathway*
- ❖ *Arrangement of the visual fibers*
- ❖ *Lesions of the visual pathway and its characteristics*

Anatomy Of Different Components Of Visual Pathway

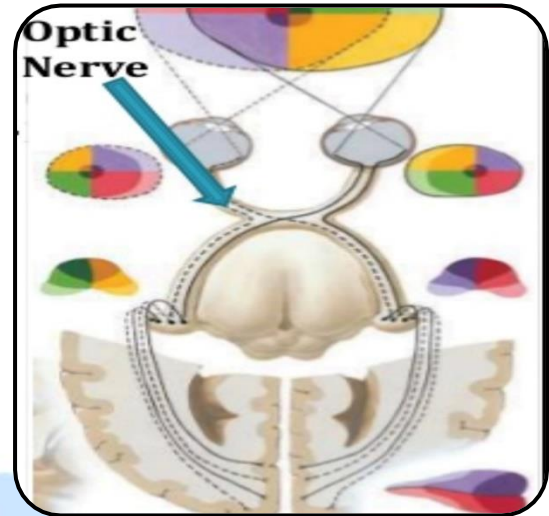
Visual Pathway

- It is the magical pathway of vision
- Each eyeball act as a camera; it perceives the images and relays the sensation to the brain via the v. pathway
- It consists of :
 1. Optic nerve
 2. Optic chiasma
 3. Optic tract
 4. Lateral geniculate body
 5. Optic radiation
 6. Visual cortex



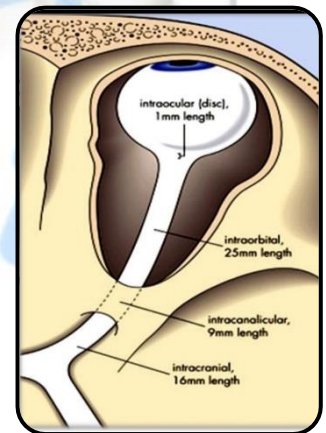
Optic nerve

- 2nd cranial nerve
- 40-50mm in length
- Extend to optic chiasma
- Formed from axons of GC of retina
- Carries about 1.2 million afferent NF
- Not covered by neurolemma; not regenerated
- Surrounded by meninges



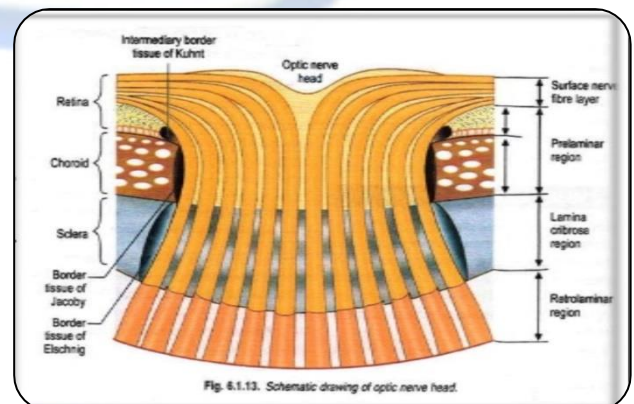
Parts Of The Optic Nerve

- Four parts:
 1. Intraocular
 2. Intra-orbital
 3. Intra-canalicular
 4. Intra-cranial



Intraocular Part

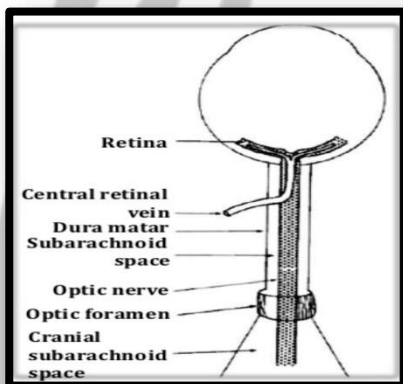
- Passes via sclera, choroid and appear in the eye as optic disc
- It is about 1.5 mm which expand to 3 mm just behind the eye (M. Sheaths)
- It is also known as optic nerve head ONH



- Which is 4 portions:
 - I. Intra orbital part:**
 - 25-30 mm
 - Extend from the back of the eye to the optic foramen at orbital apex
 - II. Intra canalicular part**
 - 6-9mm ; enter the canal through foramen
 - III. Intracranial part:**
 - 10 mm average
 - Lies above the cavernous sinus and converge with its fellow (over diaphragma sellae to form chiasma)

Meningeal Sheath Of The Optic Nerve

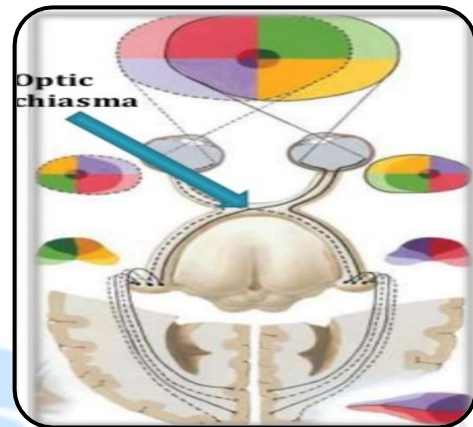
- Intraocular pia only
- Intra canal & intra orbital all 3 layers of meninges
- So meningeal sheaths, subdural & sub arachnoid spaces around optic nerve are continuous with those of brain



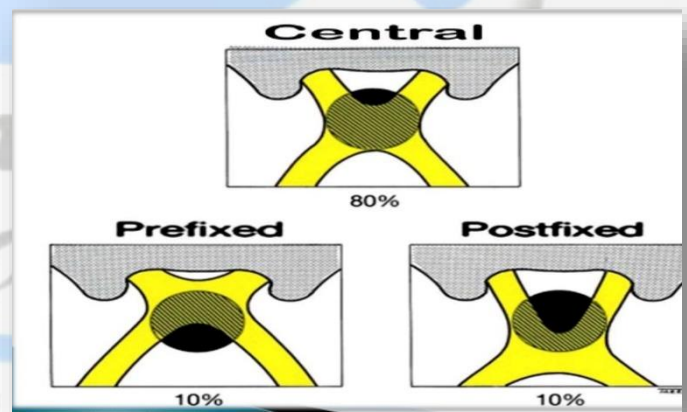
Optic Chiasma

- Arise as continuation of ON and conveys fibers to optic tract
- Flattened structure, 12 mm transverse, 8mm antero posterior
- Lies over tuberculum & diaphragma sellae
- Anterolateral angles continuous with optic nerves
- Postero lateral angles continuous with optic tracts

Optic Chiasma



Anatomical Variations Of Optic Chiasm

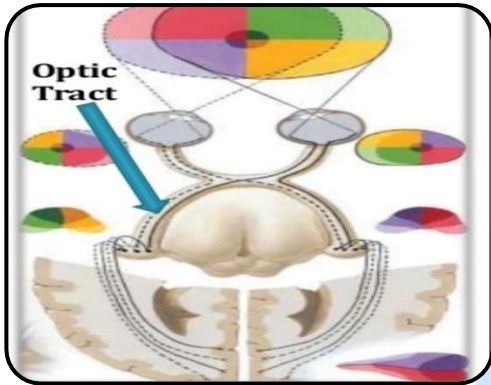


Anatomical Variations Of Optic Chiasm

- Central (80%): lies directly over sella, so that expanding pituitary tumours will involve the chiasma 1st
- Prefixed (10%): located more anteriorly, over tuberculum sellae, so pit. Tumours involve optic tract 1st
- Postfixed (10%): located more posteriorly, over the dorsum sellae so pit. Tumours are apt to damage the optic nerve 1st

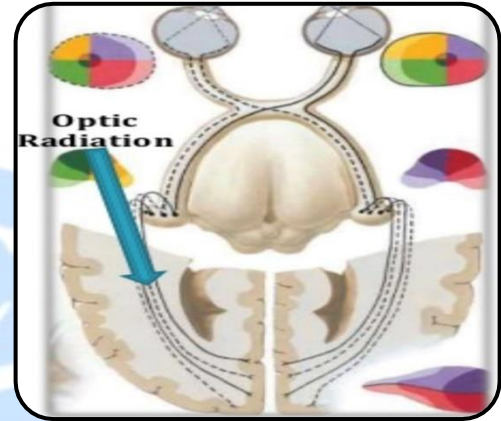
Optic Tract

- Cylindrical bundles of nerve fibers
- Runs outward&backward from p/lateral aspect of chiasma
- Between tuber cinereum and anterior perforated substance to unite cerebral peduncles
- Posteriorly each tract ends in lateral geniculate body LGB



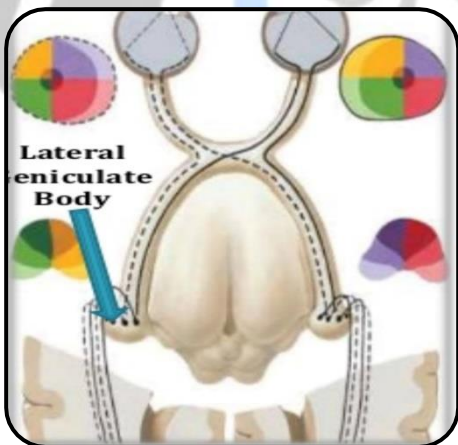
Optic Radiation

- Also called "geniculocalcarine pathway" extend from LGB to visual cortex
- It passes posteriorly through the retro lenticular part of the internal capsule terminates in the visual cortex
- Fibers of optic radiations are axons of nerve cells of the LGB



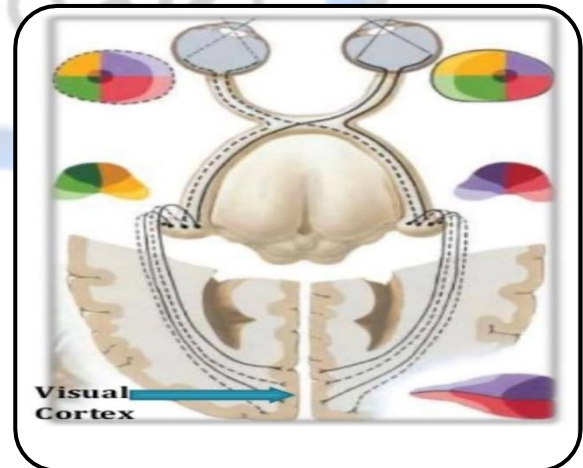
Lateral Geniculate Body (LGB)

- Small oval structure projecting from the pulvinar of the thalamus
- Each geniculate body consists of 6 layers neurones (grey matter) alternating with white matter
- Axons of the nerve leave to form optic radiation



Visual Cortex

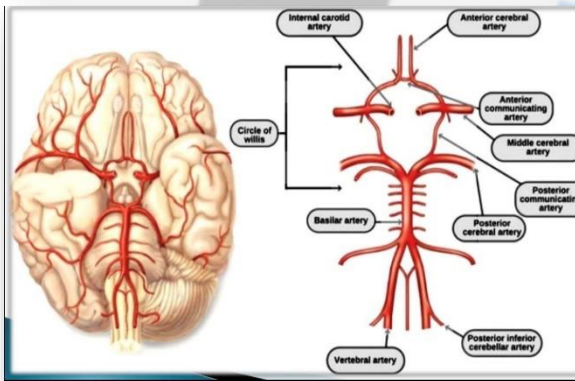
- Located on the medial aspect of the occipital lobe in&near calcarine fissure
- Subdivided into:
 1. Visuopsychic area:
 - Peristriate area 18
 - Parastriate area 19
 2. Visuosensory area
 - Striate area 17



Blood Supply Of Visual Pathway

- It receives its blood supply from 2 arterial system, the carotid system & vertebral connected to each other at the base of the skull "arterial circle of Willis"
- Branches of the carotid system are:
 1. Ophthalmic artery
 2. Small branches of ICA
 3. Posterior communicating artery
 4. Anterior cerebral artery & middle cerebral artery
- Branches from vertebral systems:
 - Cortical, central & choroidal branches of posterior cerebral arteries

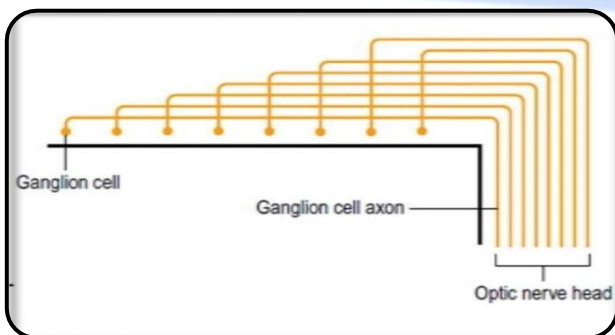
Blood supply of the visual pathway



Arrangement of visual fibers

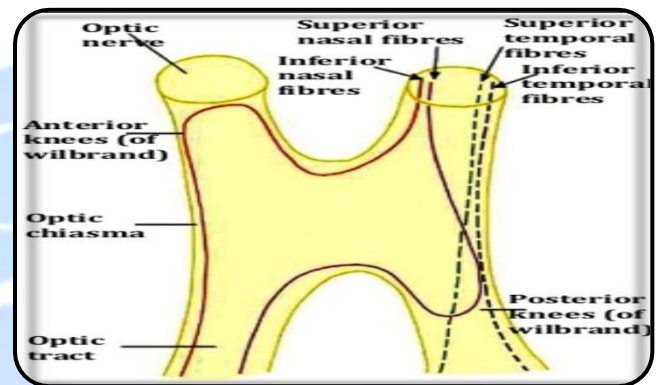
Optic nerve (in ONH)

- Peripheral fibers: lie deep in retina but occupy the most peripheral part superficial of the disc
- Fibers close to ONH: lie superficial in retina but occupy more central deep part of optic nerve



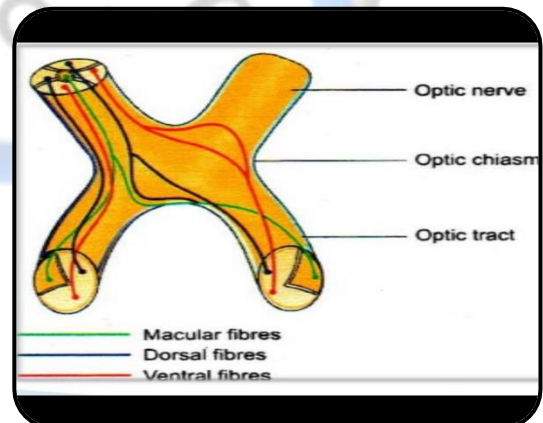
Optic chiasma

- Temporal fibers: uncrossed & runs backwards in lateral part of chiasma
- Nasal peripheral fibers:
 - Cross over to enter medial part of opposite optic tract
 - Lower nasal fibers traverse chiasma low & anteriorly
 - Upper nasal fibers traverse chiasma high and posteriorly



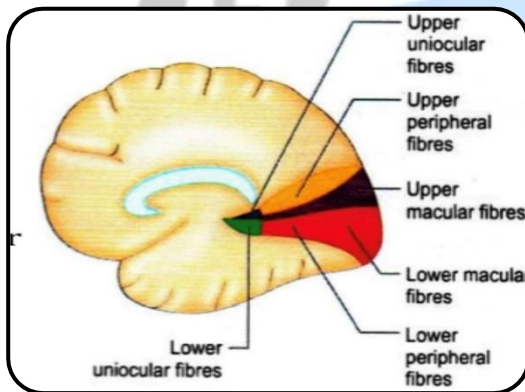
Macular fibers

- Some fibers occupying central part remains **uncrossed** & runs on same side in optic tract
- Some nasal fibers **crossed** in posterior most part of chiasma at supraoptic recess (decussate) & runs backward in opposite optic tract



Visual cortex(cortical retina)

- There is a point to point projection of the retina in the v. cortex
- It is only here the impulses originating from corresponding of 2 retina meet and a true copy of the retinal image is formed
- The Rt. V.Cortex receives impulses from temporal half of Rt. retina & nasal half of Lt. retina.
- Fibers from macular area : relay posteriorly in the v. cortex
- Fibers from peripheral retinae: end anterior to macular fibers ; those from upper retinae above calcrine sulcus



Visual field

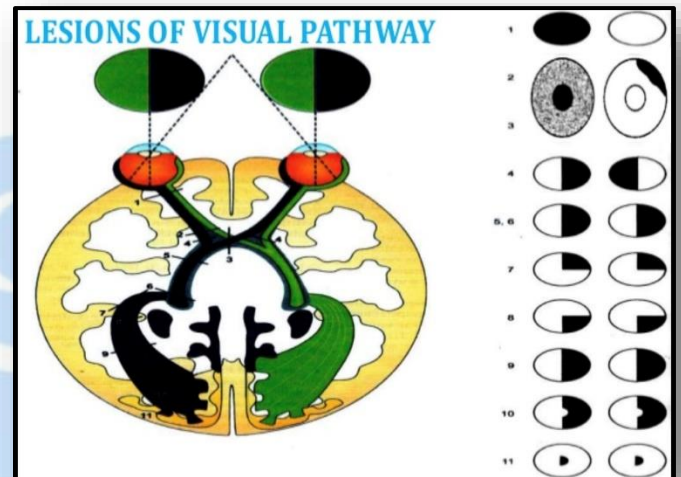
- Each eyes sees a part of visual field that defines its visual field
- Visual field of both eyes overlap to create binocular visual field
- Total visual field is the sum of Rt. & Lt. hemi-fields & consists of a binocular zone & two monocular zones
- Binocular vision is depend on the EOM aligning the eyes so that the image falls on the corresponding points on the retina of each eye

Neural pathway for vision

- 1st order neurons: arise from bipolar cells
- 2nd order neurons: are multipolar neurons there axons run along the ON to the optic chiasma
 - Nasal fibers: cross to the oppsite side to terminate in the LGB of opposite side
 - Temporal fibers: doesn't cross terminate in epsilaterl LGB

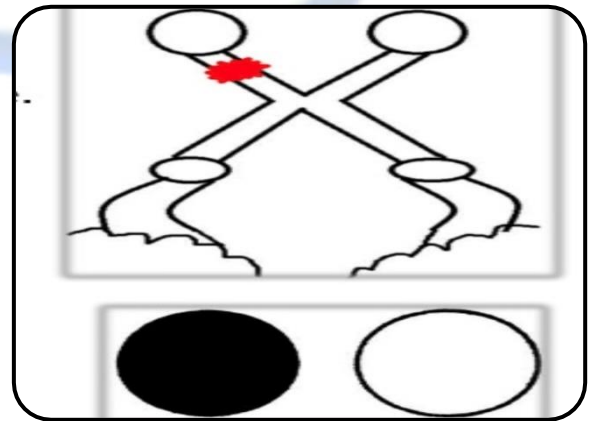
- 3rd order neurones: from LGB axons ends in visual cortex

LESIONS OF THE VISUAL PATHWAY AND ITS CHARACTERISTICS



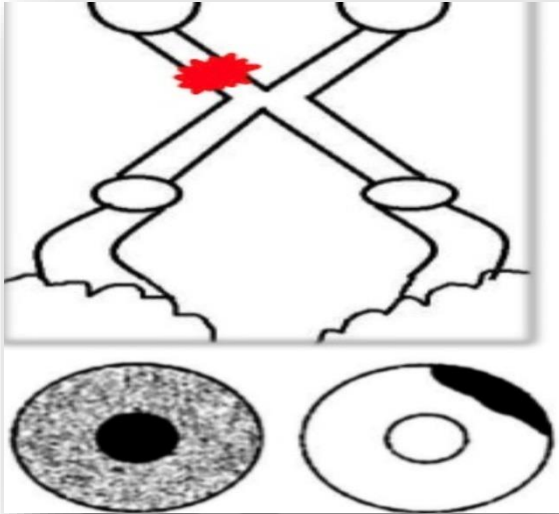
Lesion of optic nerve

- **Causes:**
 1. Optic atrophy
 2. Traumatic avulsion
 3. Acute optic neuritis
 4. Optic neuropthy
- **Field loss:** Ipsilateral blindness
- **C/P:** A abolition of direct light reflex on ipsilateral side & consensual on contralateral side
- Accommodation (near) reflex is present



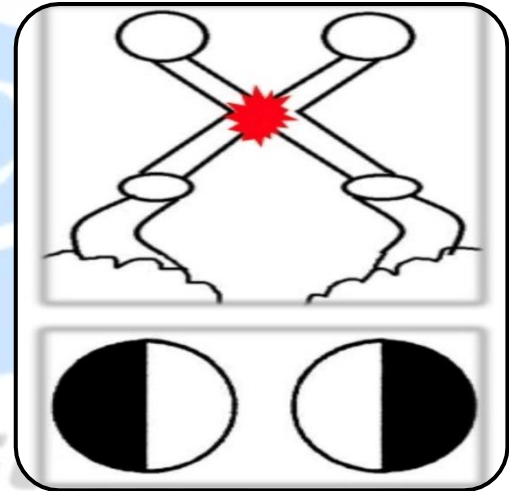
Lesion in proximal part of optic nerve

- **Causes:** tuberculum sellae meningioma
- **Field loss :**
 - Ipsilateral central scotoma
 - Contralateral junctional scotoma
- **C/P:**
 - Abolition of direct light reflex on ipsilateral side & consensual on contralateral side
 - Accommodation reflex present



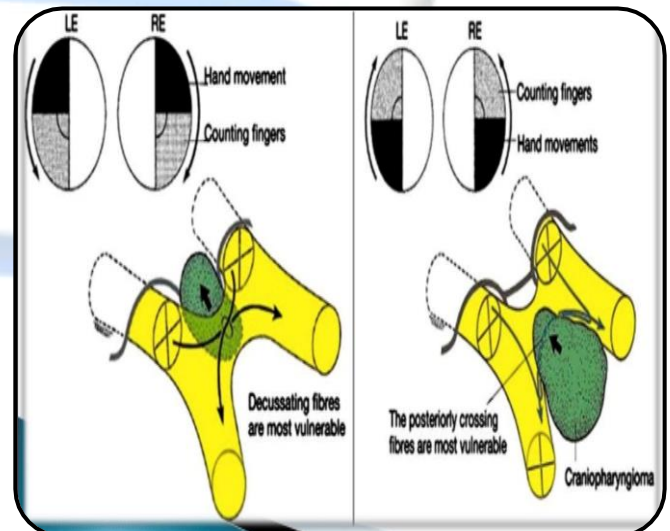
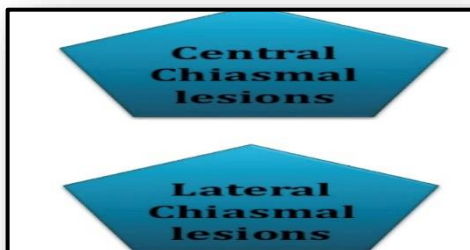
Central lesions

- **Causes:**
 1. Pituitary adenoma
 2. Craniopharyngioma
 3. Suprasellar aneurism,
 4. meningioma&glioma of 3rd ventricle
- **Field loss:** Bi -temporal hemianopia
- **C/P:**
 - Bitemporal hemianoptic paralysis of pupillary reflex,
 - Partial optic atrophy



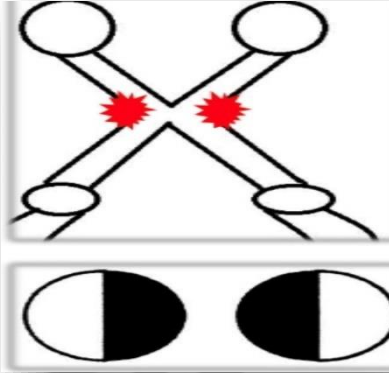
Lesion of the optic chiasma

- **Causes:**
 - Intrinsic:**
 1. Glioma
 2. MS
 - Extrinsic:** compressive lesions as:
 1. pituitary adenoma,
 2. craniopharyngioma,
 3. meningioma.
 - Others:**
 1. Metabolic
 2. Toxic
 3. Inflammatory



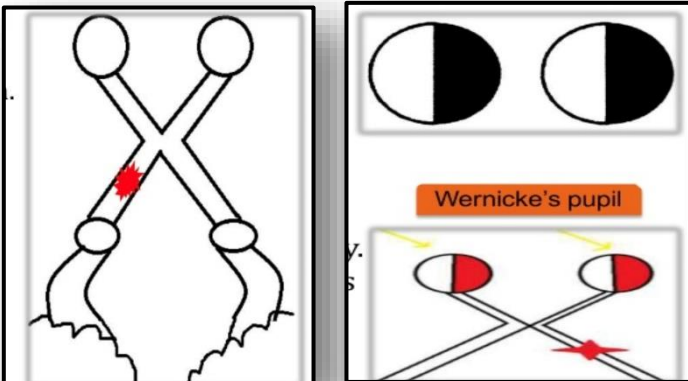
Lateral chiasmal lesions

- **Causes:**
 1. Distension of 3rd ventricle,
 2. Atheroma of carotid and posterior communicating arteries
- **Field loss:** Binasal hemianopia
- **C/P:**
 - Binasal hemianoptic paralysis of pupillary reflex,
 - partial optic atrophy



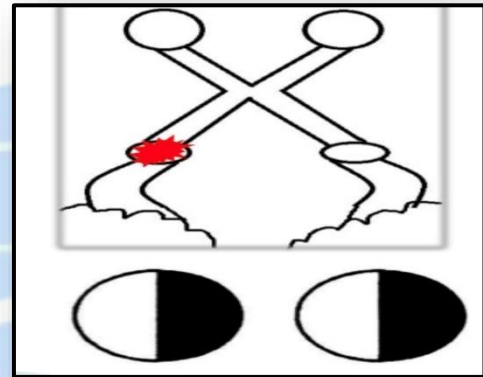
Lesions of the optic tract

- **Causes:**
 1. syphilitic meningitis,
 2. tuberculus meningitis,
 3. aneurism of superior cerebellar or posterior cerebral arteries,
 4. demyelinating diseases and infarctions
- **Field loss:** Incongruous homonymous hemianopia with contralateral hemianopic pupillary reaction (Wernicke's reaction)
- **C/P:**
 - Partial optic atrophy, contralateral 3rd nerve palsy
 - ipsilateral hemiplegia and Wernick's pupil

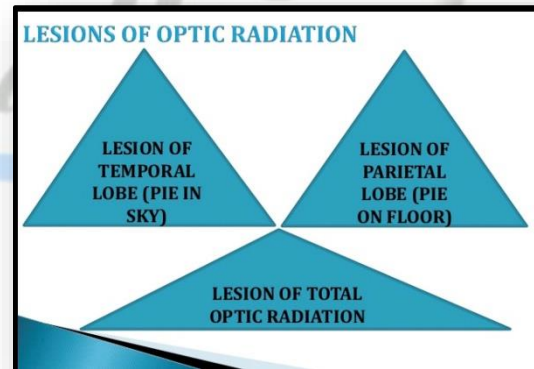


Lesions of LGB

- **Causes:**
 1. vascular,
 2. tumour,
 3. trauma
- **Field loss:** homonymous hemianopia
- **C/P:**
 - Pupillary reflex present,
 - Partial optic atrophy



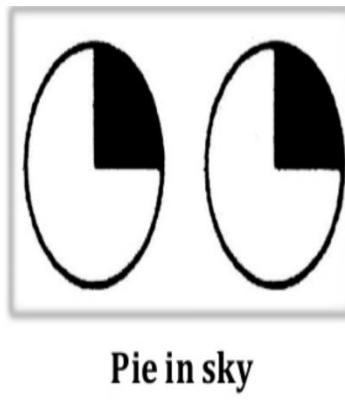
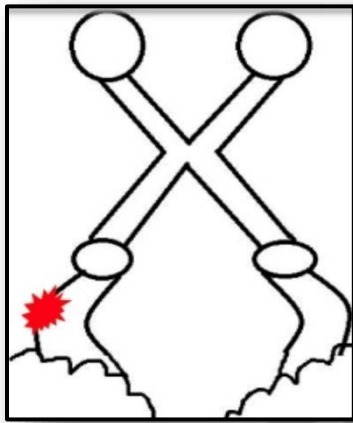
Lesion of the optic radiation



Lesion of temporal lobe of the optic radiation (pie in sky)

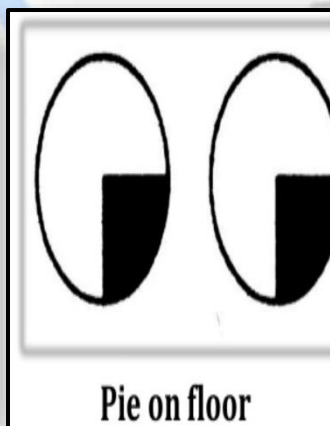
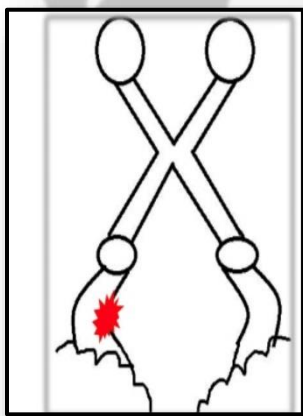
- **Causes:**
 1. vascular,
 2. tumour,
 3. trauma
- **Field loss:** contralateral homonymous superior quadrant-anopia (pie in sky)
- **C/P:**
 - Contralateral hemisensory disturbance,
 - Mild hemiparesis
 - Paroxysmal olfactory hallucination

- Formed visual hallucination
- Seizures
- Receptive dysphasia



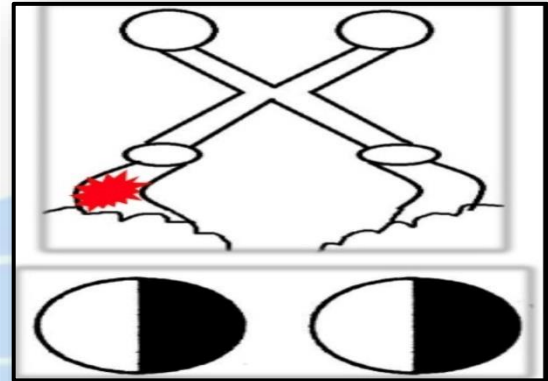
Lesion of parietal lobe of optic radiation (pie on floor)

- **Causes:**
 1. Vascular,
 2. Tumour,
 3. Trauma
 4. Infection mainly candidiasis
- **Field loss:** contralateral homonymous inferior quadrantanopia (pie on floor)
- **C/P:**
 - Acalculia
 - Agraphia
 - L/R disorientation
 - Finger agnosia
 - Spatial neglect



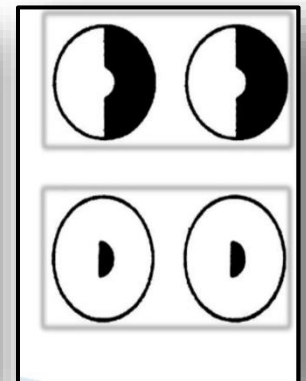
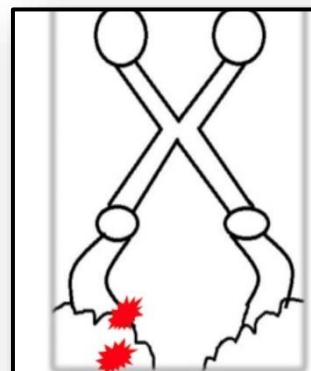
Lesion of total optic radiation

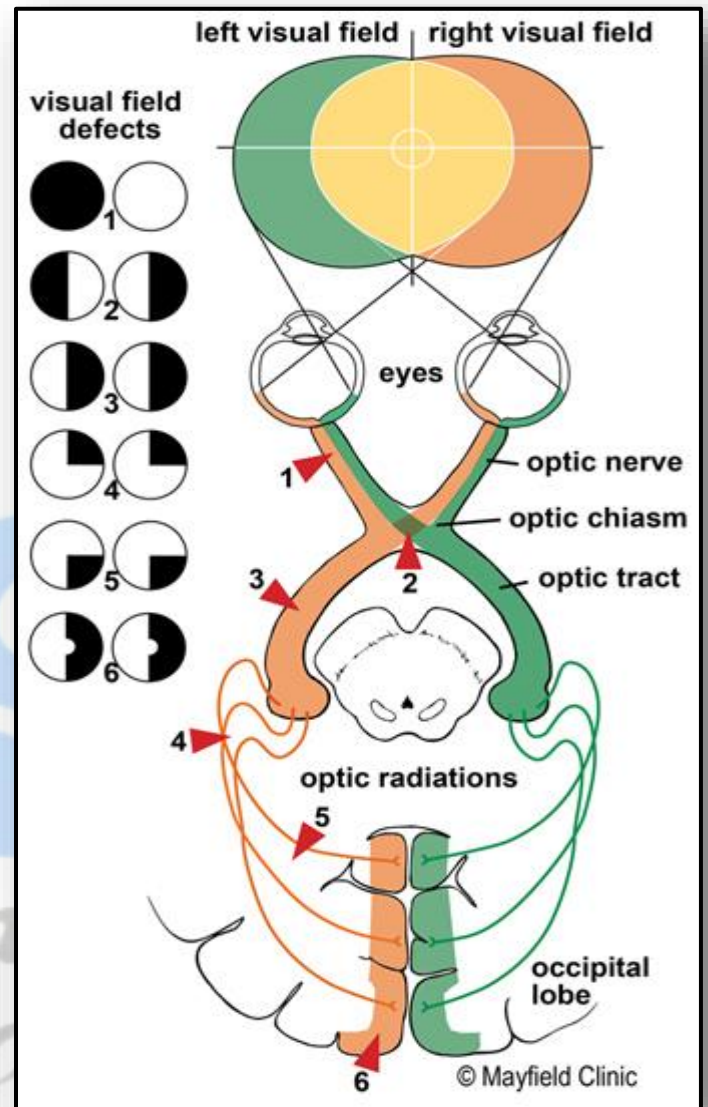
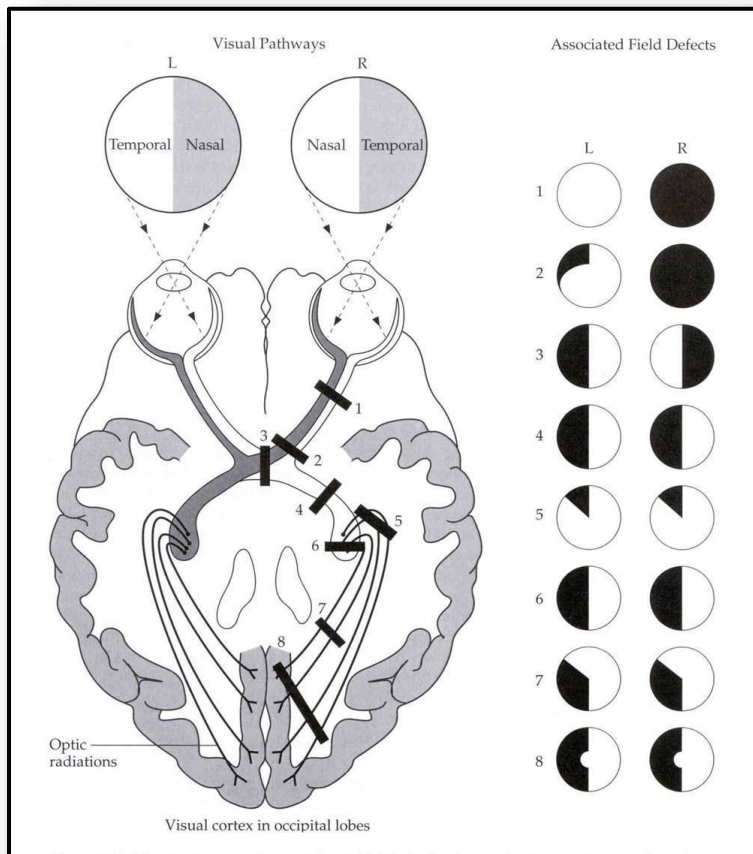
- **Causes:**
 1. Vascular,
 2. Tumour,
 3. Trauma
- **Field loss:** complete homonymous hemianopia
- **C/P:** No optic atrophy normal pupillary reaction



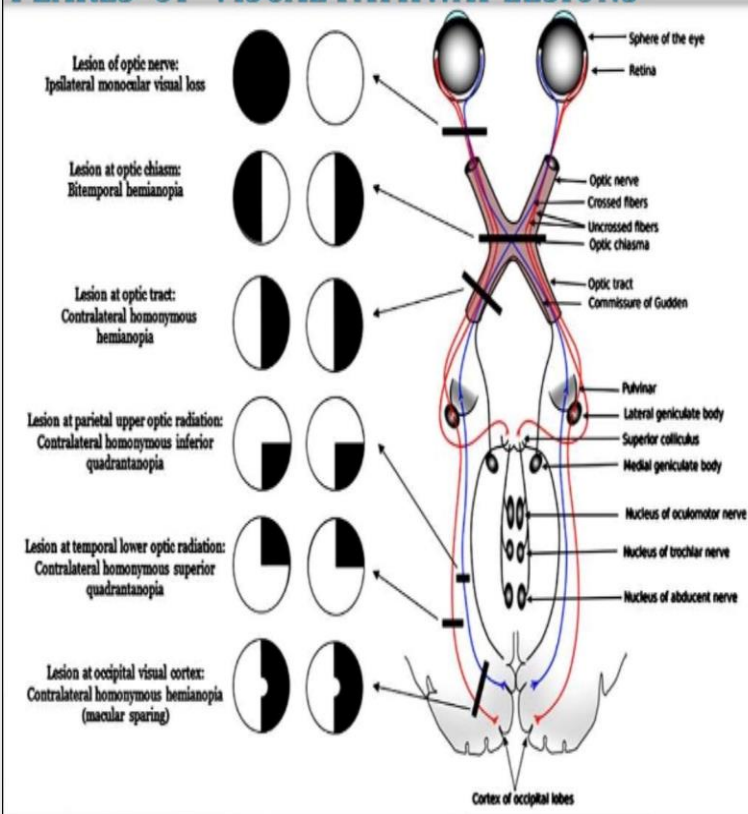
Lesion of visual cortex

- **Causes:**
 1. occlusion of PCA,
 2. Head injury,
 3. migraine, stroke,
 4. tumors
- **Field loss:**
 - Macular sparing congruous homonymous hemianopia (lesion lateral to calcarine sulcus)
 - Congruous homonymous macular defect (lesion tip of the occipital cortex)
- **C/P:** Normal pupillary reflex, No optic atrophy
- **Other features:**
 - Cortical blindness
 - Dyschromatopsia
 - Visual hallucinations
 - Polyopia





PEARLS OF VISUAL PATHWAY LESIONS



THANK YOU